

Jim Danner

SPECIAL EDITION

Service Data Book

SERVICE DATA

Engine...Chassis...
Electrical...with
Tolerances and
Clearances



WIRING DIAGRAMS

Starting, Lighting,
Ignition Data



TUNE-UP

1938 Specifications

AUTOMOBILE
DIGEST

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A U T O M O B I L E D I G E S T

SERVICE DATA Book

THE Wiring Diagrams, Test Data and Repair Specifications in this Manual are published to furnish service men with a ready source of reference, providing factory-approved service data on the models listed, that they may have authentic information on hand when the need arises.

Inasmuch as there is but one printing of each edition, readers are urged to preserve this and future copies of the Service Data Book. Each succeeding edition includes new models which take the place of the older ones, removed.

NOTE!

DC	means "dead center"
ATC or ATDC	" "after top dead center"
ABC or ABDC	" "after bottom dead center"
BTC or BTDC	" "before top dead center"
BBC or BBDC	" "before bottom dead center"
Timing in Inches (")	" piston travel
Timing in Degrees (°)	" flywheel rotation

A U T O M O B I L E D I G E S T

THE MASTER JOURNAL OF COMPLETE AUTOMOTIVE SERVICE

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1938 Tune-Up Data

CAR MODEL and YEAR	Spark Plug Gap Inches	Breaker Gap Inches	SPARK TIMING			VALVE TIMING			TAPPET CLEARANCE		CARBURETOR			Idle Adjustment Turns Open
			Spark Occurs ° T.D.C.	Number of Flywheel Teeth—Spark Occurs T.D.C.	Breaker Housing	Inlet Opens ° T.D.C.	Inlet Opens Flywheel Teeth T.D.C.	Inlet Tappet Gap Inches	Inlet—Inches	Exhaust—Inches	Make	Dimension Inches	Figure No.	
AMERICAN BANTAM—M/60, 1938	.025	.022	...		Auto	19B	4½B	.006	.006H	.006H	A	Tillotson		.....
BUICK—Series 40, 1938, Marvel Carb.	.026	.0125-.0175	4B	1½B	Adv.	13B	5¼B	.015	.015H	.015H	A	Marvel	11/16*	3/4-1
BUICK—Series 40, 1938, Stromberg Carb.	.026	.0125-.0175	4B	1½B	Adv.	13B	5¼B	.015	.015H	.015H	A	Strom	19/32*	1
BUICK—Series 60, 80, 90, 1938, Stromberg Carb.	.026	.0125-.0175	6B	2½B	Adv.	14B	6+B	.015	.015H	.015H	A	Strom	19/32*	1½
BUICK—Series 60, 80, 90, 1938, Marvel Carb.	.026	.0125-.0175	6B	2½B	Adv.	14B	6+B	.015	.015H	.015H	A	Marvel	3/4*	7/8
CADILLAC—Series 60, 60-S, 65&75, 1938	.027	.0125-.0175	5B	2½B	Adv.	T.D.C.	.....	Auto	Auto	Auto	A	Strom	5/8*	Note 4
CADILLAC—V-12, Series 90, 1938	.027	.0125-.0175	6B	2½B	Adv.	8B	3½B	Auto	Auto	Auto	..	Carter	14	.....
CHEVROLET—Master & Mas. De Luxe, 1938	.040	.018	5B	2B	Auto	9B	3½B	....	.006H	.013H	A	Carter	5/8	3 1-2
CHRYSLER—Royal Six, 1938	.025	.020	T.D.C.	.....	Auto	8B	3¼B	.014	.008H	.010H	A	Carter B&B	5/64	9 1/2-1½
CHRYSLER—Imp. 8, 1938	.025	.018	3A	1¼A	Auto	2B	7/8B	.011	.006H	.010H	A	Strom	5/8*	Note 4
CHRYSLER—Cust. Imp. 8, 1938	.025	.018	5A	2A	Auto	2B	7/8B	.011	.006H	.010H	A	Strom	5/8*	Note 4
DE SOTO—S5, 1938	.025	.020	T.D.C.	.....	Auto	8B	3¼B	.014	.008H	.010H	A	Carter B&B	5/64	9 1/2-1½
DODGE—D8, 1938	.025	.020	4A	1½A	Auto	6A	2½A	.011	.006H	.008H	A	Strom	5/8*	Note 4
FORD—V8-60, 1938	.025	.014	4B	1½B	Auto	9½B	3¼B	.013	.013C	.013C	A	Strom	15/32*	Note 4
FORD—V8-85 Std. & De Luxe, 1938	.025	.014	4B	1½B	Auto	9½B	3¼B	.013	.013C	.013C	A	Strom	15/32*	Note 4
GRAHAM—Special & Supercharger, 1938	.025	.018	4B	1½B	Auto	4½B	15/8B	.012	.010H	.010H	A	Marvel	19/32	4† Note 4
HUDSON—Terraplane 80, 81 & 88, 1938	.032	.020	T.D.C.	.....	Auto	10½B	4B	.010	.006H	.008H	A	Carter	5/8	3 1/4-1
HUDSON—Terraplane 82, 1938	.032	.020	T.D.C.	.....	Auto	10½B	4B	.010	.006H	.008H	A	Carter	5/64	14 1/4-3/4
HUDSON—Six, 83, 1938	.032	.020	T.D.C.	.....	Auto	10½B	4B	.010	.006H	.008H	A	Carter	9/64	14 1/4-3/4
HUDSON—Eight, 84, 85 & 87, 1938	.032	.020	T.D.C.	.....	Auto	10½B	4B	.010	.006H	.008H	A	Carter	5/64	14 1/4-3/4
HUPMOBILE—Six, Series E822, 1938	.029	.018-.020	7B	2+B	Auto	2B	5/6B	.014	.010H	.013H	A	Carter	5/8	3 1/4-1½
HUPMOBILE—Eight, 1938	.029	.018-.020	7B	2+B	Auto	1A	1/3A	....	.006H	.013H	B	Carter	3/16	14 1/4-1
LA SALLE—38-50, 1938	.027	.0125-.0175	5B	2½B	Adv.	T.D.C.	.....	Auto	Auto	Auto	A	Carter	3/16	14 1/4-1
LINCOLN—Zephyr, 1938	.028	.014	4B	1¼B	Auto	19½B	6B	Auto	Auto	Auto	A	Strom	15/32*	Note 4
LINCOLN—V12, 1938	.025	.015	7B	2¼B	Auto	21B	6½B	Auto	Auto	Auto	B	Strom	15/32*	Note 4
NASH—Lafayette Mas. & De Luxe, 1938	.025	.022	4B	1½B	Auto	.....	....	.015	.015H	.015H	A	Strom	5/8*	Note 4
NASH—Amb. 6, 1938	.025	.022	4B	1½B	Auto	.....	....	.015	.015H	.015H	A	Marvel	19/32	4† Note 4
NASH—Amb. 8, 1938	.025	.020	9B	2½B	Auto	.....	....	.015	.015H	.015H	B	Strom	1/2*	Note 4
OLDSMOBILE—Six, F38, 1938	.040	.020	T.D.C.	.....	Auto	.5B	2B	.008	.008H	.011H	A	Carter	5/8	3 1-1½
OLDSMOBILE—Eight, L38, 1938	.030	.015	2B	7/8B	Auto	T.D.C.	.....	.008	.008H	.011H	A	Carter	9/64	14 1/2-1½
OLDSMOBILE—Six (Auto Trans.) 1938	.040	.020	T.D.C.	.....	Auto	5B	2B	.008	.008H	.011H	A	Carter	5/8	3 1/2-1
OLDSMOBILE—Eight, L38, 1938 (First run)	.030	.015	2B	7/8B	Auto	T.D.C.	.....	.008	.008H	.011H	A	Carter	9/64	14 3/4-1¾
PACKARD—Six, 1937, H. C. Head	.028	.015	4-6B	1½-2½B	Auto	5B	1½B	.017	.007H	.010H	A	Chand. Groves	17/32*	7/8
PACKARD—Six, Series 1600, 1938	.027	.020	4½-6B	1½-2½B	Auto	1B	1/3+B	.015	.007H	.010H	A	Chand. Groves	17/32*	7/8
PACKARD—6, Ser. 1600, 1938, H. C. Head	.027	.020	2½-4B	1-1½B	Auto	1B	1/3+B	.015	.007H	.010H	A	Chand. Groves	17/32*	7/8
PACKARD—8, Series 1601, 2, 1938	.027	.015	6-8B	2½-3B	Auto	1B	1/3+B	.015	.007H	.010H	A	Strom	15/32*	Note 4
PACKARD—8, Ser. 1601, 2, 1938, H. C. Head	.027	.015	2½-4B	1-1½B	Auto	1B	1/3B	.015	.007H	.010H	A	Strom	15/32*	Note 4
PACKARD—8, Series 1603, 4, 5, 1938	.027	.015	6-8B	2½-3½B	Auto	30B	12½B	.006	.006H	.008H	A	Strom	5/8*	Note 4
PACKARD—12, Series 1607, 8, 1938	.027	.020	7B	2½B	Auto	T.D.C.	.....	Auto	Auto	Auto	A	Strom	9/16*	Note 4
PIERCE-ARROW—8, 1938	.023	.018	5B	1½B	Ret.	5A	15/8A	.010	Auto	Auto	A	Strom	9/16*	Note 4
PIERCE-ARROW—12, 1938	.023	.018	5B	1½B	Ret.	19B	6B	.004	Auto	Auto	A	Strom	9/16*	Note 4
PLYMOUTH—P5, 1938	.025	.020	4A	1½A	Auto	6A	2½A	.011	.006H	.008H	A	Chand. Groves	17/32*	3/4
PLYMOUTH—P5, P6, 1938	.025	.020	4A	1½A	Auto	6A	2½A	.011	.006H	.008H	A	Carter	5/64	9 1/2-1½
PONTIAC—6, 1938	.025	.020	2-6B	3/4-2½B	Auto	5B	2B	.015	.013H	.013H	A	Carter	5/8	3 1/4-1½
PONTIAC—8, 1938	.025	.015	2-6B	3/4-2½B	Auto	5B	2B	.015	.013H	.013H	A	Carter	5/8	3 1/2-1
STUDEBAKER—Six, 7A, 1938	.025	.020	2B	3/4B	Auto	15B	5½B	.020	.016C	.020C	A	Strom	5/8*	Note 4
STUDEBAKER—Com. Six, 8A, 1938	.025	.020	2B	3/4B	Auto	15B	5½B	.020	.016C	.020C	A	Strom	5/8*	Note 4
STUDEBAKER—Pres. 8, 4C, 1938	.025	.020	T.D.C.	.....	Auto	15B	5½B	.020	.016C	.020C	A	Strom	5/8*	Note 4
WILLYS—38, 1938	.025	.020	5A	1½A	Auto	T.D.C.	.....	.010	.004H	.006H	A	Tillotson	3/4*	Note 11

CARBURETOR NOTES

4—Turn adjusting screw in until engine begins to "lag" or run irregularly, then slowly turn out until engine begins to "roll." Finally turn in again just enough so that engine runs smoothly for idle throttle opening.
 11—Carburetor has two adjustments. Main adjustment approximately 2 1/2° turns open. Idle adjustment 1 1/2° turns open.
 12—Float bowl inverted.

*Fuel level measured from top of float bowl to fuel level—not float level. In some cases based on pump pressure—9/16" or less; 2 lbs. pressure; above this 3 lbs. pressure.

NOTE: The figures referred to in the above table, as well as tune-up data on models prior to 1938 will be found on the last pages of the book, 44-47.

Buick, 1937

SERIES 60, 80, 90*

* All specifications apply to the 60 "Century," 80 "Roadmaster" and 90 "Limited" unless special mention is made.

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{7}{16}$ ".
Stroke— $4\frac{9}{16}$ ".
Taxable H. P.—37.81.
Displacement—320.2 cu. in.
Firing Order—1-6-2-5-3-7-4.
Max. H. P.—130 at 3400 r.p.m.

CAMSHAFT

Drive—Link-belt chain.
Chain Data—50 links, $1\frac{1}{4}$ " wide, $1\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks in line with copper-plated washers on chain.
Bearings—5, steel backed, babbitt lined.
End Thrust Taken On—Thrust plate front end.
Bearing Clearance—.0005"--.0035".

CONNECTING RODS

End Clearance—.005"--.010".
Dia. Clearance—.0008"--.0018".

COOLING SYSTEM

Capacity—17 qts.
Pump Drive—Belt.
Belt Size— $45^{\circ}V$, $45\frac{1}{16}$ " inside x $29\frac{3}{32}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Self-adjusting.

CRANKSHAFT

No. Bearings—8.
Material—Steel-backed babbitt.
End Thrust Taken On—Center.
End Clearance—.004"--.007".
Dia. Clearance—.0007"--.0022".

FUEL SYSTEM

Carburetor Make—Stromberg "AA2."
Type—Dual down draft.
Adjustment—Turn needle out for rich mixture. Turn needle in for lean mixture.
Fuel Delivery—A. C. pump type "AB."

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—Dry, 9 qts; refill, 8 qts.
Oil Pressure—45 lbs. at 35 m.p.h.
Adjustment—Non-adjustable.
Oil $\left\{ \begin{array}{l} 120^{\circ}-50^{\circ} \dots S.A.E. 30 \\ 80^{\circ}-30^{\circ} \dots S.A.E. 20 \\ 80^{\circ}-10^{\circ} \dots S.A.E. 20W \\ 45^{\circ} \text{ minus } 10^{\circ} \dots S.A.E. 10W \\ 20^{\circ} \text{ minus } 20^{\circ} \dots S.A.E. 10W, +10\% \text{ kerosene.} \end{array} \right.$

PISTONS

Material—Lo-Ex alloy, tri-slot, cam ground.
Clearance—Top—.0215"-.0285".
Clearance—Bottom—.0020"--.0026"; .0023" desired.

PISTON RINGS

Gap—.010"--.015".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0003"--.0004" at 70°F .
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{16}$ ".
Dia. Intake— $1\frac{25}{32}$ ", streamlined head.
Stem Dia.—Int. .3715"-.3725"; Exh. .3711"-.3719".
Seat Angle—45°.
Seat Width—.075".
Tappet Type—Cylindrical.
Clearance—Hot:
Intake—.015" { .004" valve off
Exhaust—.015" { seat for timing
Guides Removable—Yes.
Spring Pressure
42-52 lbs. valve closed total.
112-124 lbs. valve open total.

CHASSIS

FRONT AXLE

Caster—"60"— $1\frac{1}{2}$ ° + $5\frac{1}{2}$ °.
"80", "90"— $3\frac{1}{2}$ ° + $5\frac{1}{2}$ °.
Camber— $1\frac{1}{4}$ ° + 1°.
Toe-in—0"- $1\frac{1}{16}$ ".
Kingpin Angle—"60"— $3\frac{1}{2}$ °- $4\frac{1}{2}$ °.
"80"— $4\frac{1}{2}$ °- $5\frac{1}{4}$ °; "90"— 4° - 5° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—"60"—Semi-floating hypoid.
"80", "90"—Semi-floating, spiral bevel.
Pinion Bearing Type—"60"—N. D. No. 905126 and Hyatt No. 125630.
"80", "90"—N. D. No. 905307 and Hyatt No. 126047.
Bearing Adjustment—None; pinion adjustment shims.
End Play—Not given.
Lash—.008"--.010".
Diff. Bearing Type—"60"—N. D. Difrax No. 902113; "80", "90", N. D. Difrax No. 902110.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—"60"—3 lbs.; "80", "90", 4 lbs.

TRANSMISSION

Make and Type—Own, helical gears.
Main Shaft Bearing Type and No.—N. D. 954144 and 954120.
Countershaft Bearing Type and No.—Bantam needle bearing No. 1298445.

BRAKES

Type—Hydraulic.
Lining Type—Hard compressed woven.
Lining Size—"60"— $221\frac{1}{16}$ " x 2" x $3\frac{1}{16}$ " x $3\frac{1}{16}$ ".
"80", "90"— $261\frac{1}{16}$ " x 2" x $3\frac{1}{16}$ ".
Clearance—Top—.010" + .002".
Bottom—.010" + .002".
Brake Effort—"60"—53% front; 47% rear.
"80", "90", 52.4% front; 47.6% rear.

CLUTCH

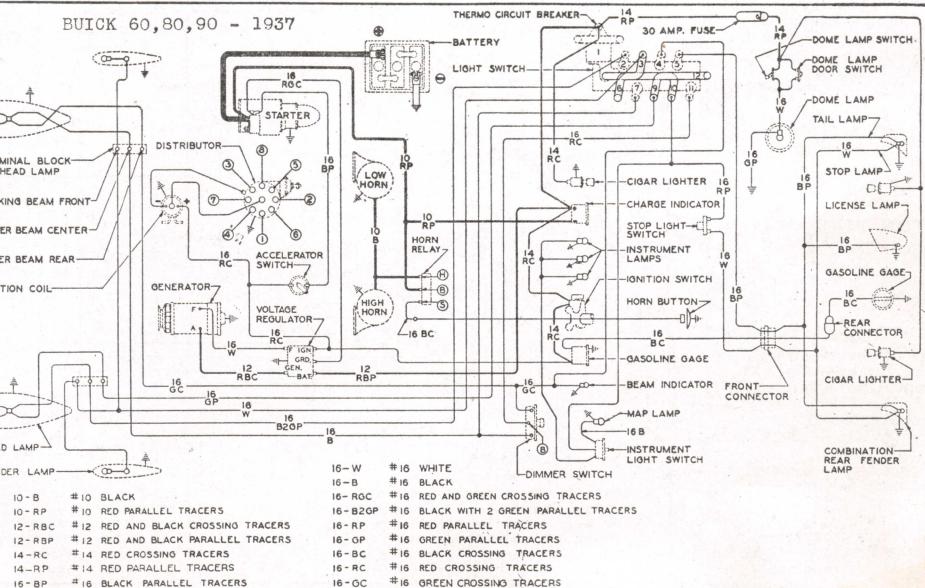
Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. No. 907109.
Throwout Bearing Type and No.—N. D. No. 954175.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded type.

STEERING GEAR

Type—Worm and double roller, straddle mounted.
Lubricant—Not given.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 727W.
Drive—Over-running clutch.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts, 5000 r.p.m.
Lock Torque—16 ft. lbs., 600 amps., 3 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 918A.
Drive—V-belt.
Regulation—3rd brush and voltage regulator.
Thermostat—None.
Output, cold—28-30 amps., 8 volts, 4000 r.p.m.
Output, hot—25-28 amps., 8 volts, 4000 r.p.m., or 46.5 m.p.h.
Brush Spring Tension—24-28 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.4-7.0 volts at 800 r.p.m., or 9.1 m.p.h.
Amps. Discharge to Open—0-3½.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 663Z.
Coil—Delco-Remy.
Distr. Rotation—Clockwise, viewing drive end.
Breaker Gap—.0125"--.0175".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.022"--.027".
Spark Plug Size—A. C. "H-9"—18 m.m.
Manual Advance— 20° .
Automatic Advance— 12° - 16° .
Vacuum Advance— 12° .
Timing— 10° before top dead center, control in mid-position.
Coil Amps., Engine Idling— $2\frac{1}{2}$.
Coil Amps., Engine Stopped— $4\frac{1}{2}$.

BATTERY

Amps.—Delco—120 amp. hr.

LAMPS

Head—2320L.
Park—No. 55.
Instrument—No. 55.
Fuse—30 amp. and Thermo circuit breaker.
Dome—No. 81L.
Stop and Tail—No. 1154.

Buick, 1937

SERIES 40

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—30.63.
Displacement—248 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—100 at 3200 r.p.m.

CAMSHAFT

Drive—Link belt chain.
Chain Data—49 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks in line with copper-plated washers on chain.
Bearings—5, steel backed, babbitt lined.
End Thrust Taken On—Thrust plate front end.
Bearing Clearance—.0005"- .0035".

CONNECTING RODS

End Clearance—.005"- .010".
Dia. Clearance—.0008"- .0018".

COOLING SYSTEM

Capacity— $1\frac{3}{4}$ qts.
Pump Drive—Belt.
Belt Size— $45^{\circ}V$ — $42\frac{1}{16}$ " inside, $25\frac{1}{2}$ " wide.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Self-adjusting.

CRANKSHAFT

No. Bearings—8.
Material—Steel-backed babbitt.
End Thrust Taken On—Center bearing.
End Clearance—.004"- .007".
Dia. Clearance—.0007"- .0022".

FUEL SYSTEM

Carburetor Make—Stromberg "AA1."
Type—Dual downdraft.
Adjustment—Turn needle out for rich mixture. Turn needle in for lean mixture.
Fuel Delivery—A. C. mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—Dry, 7 qts.; refill, 6 qts.
Oil Pressure—45 lbs. at 35 m.p.h.
Adjustment—Non-adjustable.
Oil $\left\{ \begin{array}{l} 120^{\circ}-50^{\circ} \dots S.A.E. 30 \\ 80^{\circ}-30^{\circ} \dots S.A.E. 20 \\ 80^{\circ}-10^{\circ} \dots S.A.E. 20W. \\ 45^{\circ}-10^{\circ} \dots S.A.E. 10W. \\ 20^{\circ}-20^{\circ} \dots S.A.E. 10W. + 10\% \text{ kerosene.} \end{array} \right.$

PISTONS

Material—Lo-Ex alloy, tri-slot, cam ground.
Clearance—Top—.018"- .024".
Clearance—Bottom—.0018"- .0024", .0021 desired.

PISTON RINGS

Gap—.010"- .015".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0003"- .0004" at 70°F .
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{11}{16}$."
Dia. Intake— $1\frac{7}{8}$."
Stem Dia.—Int. .3715"— .3725"; Exh. .3711"— .3719".
Seat Angle—45°.
Seat Width—.075".
Tappet Type—Cylindrical.
Clearance—Hot:
Intake—.015" { Valve .004" off
Exhaust—.015" } seat for timing
Guides Removable—Yes.
Spring Pressure
42-52 lbs. valve closed total
112-124 lbs. valve open total.

CHASSIS

FRONT AXLE

Caster— $-\frac{1}{4}^{\circ}$ — $+\frac{5}{8}^{\circ}$.
Camber— $-\frac{1}{4}^{\circ}$ — $+1^{\circ}$.
Toe-in— $0^{\circ}1\frac{1}{16}$ ".
Kingpin Angle— $3\frac{1}{2}^{\circ}$ - $4\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid gears.
Pinion Bearing Type—N. D. No. 905126 and Hyatt 125630.
Bearing Adjustment—None; Pinion adjustment—shims.
End Play—Not given.
Lash—.008"- .010".
Diff Bearing Type—N. D. Difrax No. 902113.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—3 lbs.

TRANSMISSION

Make and Type—Own—all helical gears.
Main Shaft Bearing Type and No.—N. D. No. 954144 and 903206.
Countershaft Bearing Type and No.—Hard pressed brass, $\frac{7}{8}$ " x 1" x 2".

BRAKES

Type—Hydraulic.
Lining Type—Hard compressed woven.
Lining Size— $22\frac{1}{16}$ " x $1\frac{1}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Anchor adjustment—sliding type.
Clearance
Top—.010" + .002".
Bottom—.010" + .002".
Brake Effort—53% front; 47% rear.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. 907109.
Throwout Bearing Type and No.—N. D. No. 954175.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Worm and double roller, straddle mounted.
Adjustments—Column end play, adjusting screw in bottom cover.
Cross-shaft end play, adjusting screw side cover. Mesh—eccentric sleeve.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 734Z.
Drive—Over-running clutch.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts at 5000 r.p.m.
Lock Torque—12 ft. lbs., 575 amps., 3.4
volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 918B.
Drive—V-belt.
Regulation—3rd brush and voltage regulator.
Thermostat—None.
Output, cold—28-30 amps., 8 volts, 4000
r.p.m.
Output, hot—25-28 amps., 8 volts, 4000
r.p.m.
Brush Spring Tension—24-28 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.4-7.0 volts at 800 r.p.m
hot, or 8.1 m.p.h. approximate.
Amps. Discharge to Open— $3\frac{1}{2}$ amps.
Field Fuse—None.

IGNITION

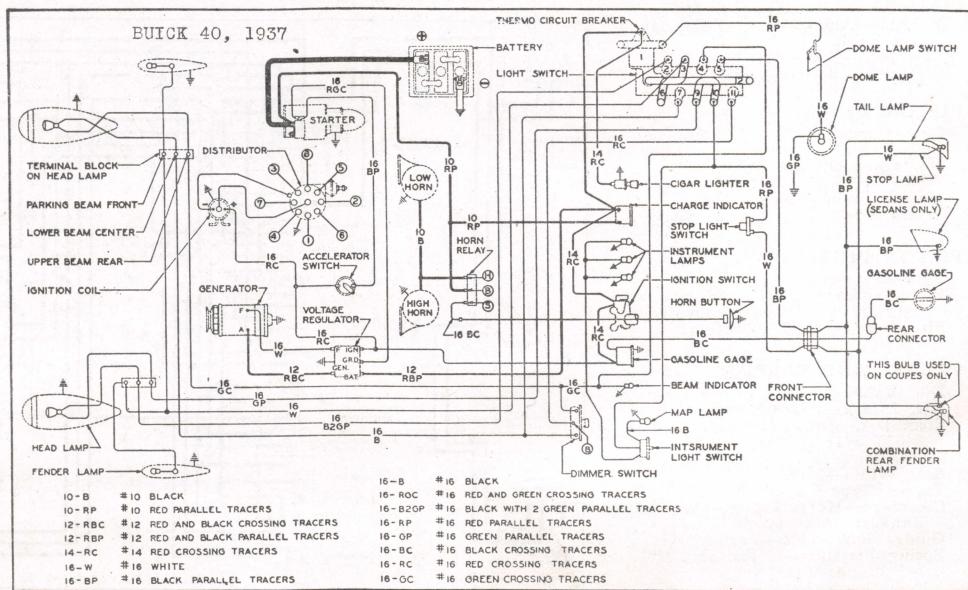
Distributor—Delco-Remy 663Y.
Coil—Delco-Remy.
Distr. Rotation—Clockwise, viewing drive end.
Breaker Gap—.0125"- .0175".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.022"- .027".
Spark Plug Size—A. C. 18 m/m "H-9."
Manual Advance— 20° .
Automatic Advance— 22° - 26° .
Vacuum Advance— 12° .
Timing— 2° before top dead center control, lever in mid position.
Coil Amps., Engine Idling— $2\frac{1}{2}$.
Coil Amps., Engine Stopped— $4\frac{1}{2}$.

BATTERY

Amps.—Delco—100 amp. hr.

LAMPS

Head—No. 2320L.
Park—No. 55.
Instrument—No. 55.
Fuse—None—Thermo circuit breaker.
Dome—No. 81L.
Stop and Tail—No. 1154.



Cadillac V-8, 1938

SERIES 38-60, 38-60S, 38-65, 38-75

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—39.20.
Displacement—346.0 cu. in.
Firing Order—1-8-7-3-5-4-2.
Front—2-4-6-8-1-3-5-7.
Max. H. P.—60-60S-65, 135 at 3400 r.p.m.
75, 140 at 3400 r.p.m.

CAMSHAFT

Drive—Morse Type C, No. 3682R.
Chain Data—62 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks in alignment opposite each other.
Bearings—Not given.
End Thrust Taken On—Front end, .0025"-, .0037".
Bearing Clearance—Not given.

CONNECTING RODS

End Clearance—.003"-, .006".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity—60-60S, 6 gals.; 65-75, $6\frac{1}{4}$ gals.
Pump Drive—Vee belt.
Belt Size—Vee, $1\frac{1}{4}$ " wide $\times 41\frac{3}{4}$ " long.
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze or steel-backed babbitt.
End Thrust Taken On—Center No. 2 bearing.
End Clearance—.001"-, .005".
Dia. Clearance—.0015".

FUEL SYSTEM

Carburetor Make—Stromberg AA-V-25.
Type— $1\frac{1}{4}$ " downdraft, dual.
Adjustment—Idle, turn in to lean; out to rich.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Helical gear.
Capacity—7 qts.
Oil Pressure—25 lbs. at 30 m.p.h.
Adjustment—None.
Winter Oil— 0° - 32° 20W; below zero 10W.
Summer Oil—Moderate speeds, 30; high speeds, 40-50.

PISTONS

Material—Alum. alloy, T-slot, anodized finish.
Clearance—Top—.0196".
Clearance—Bottom—.0021".

PISTON RINGS

Gap—Comp., .007"-, .012"; Oil, .007"-, .015".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0004", press fit one end; .0000" clearance other end.
Fit in Rod—.0002"-, .0008".

VALVES AND TAPPETS

Dia. Exhaust— $1.626^{\prime\prime}$ - $1.636^{\prime\prime}$.
Dia. Intake— $1.876^{\prime\prime}$ - $1.886^{\prime\prime}$.
Stem Dia.—Int., .3415"-, .3425"; Exh., .3405"-, .3415".
Seat Angle— 45° .
Seat Width— $\frac{5}{64}$ ".
Tappet Type—Hydraulic.
Clearance—Hot: Intake—Automatic.
Exhaust—Automatic.
Guides Removable—Yes.
Spring Pressure—66 lbs. at 1.926".
145 lbs. at 1.581".
Free length 2.210".

CHASSIS

FRONT AXLE

Caster—60, 60S, $3\frac{1}{4}^{\circ}$ - 0° ; 65 and 75, 0° + $\frac{1}{4}^{\circ}$.
Camber—60, 60S, $\frac{1}{4}^{\circ}$ - $1\frac{1}{2}^{\circ}$; 65 and 75, 0° - $\frac{1}{2}^{\circ}$.
Toe-in—Car in motion, 0° - $\frac{1}{16}^{\circ}$; at rest, $\frac{1}{32}^{\circ}$ - $\frac{3}{32}^{\circ}$.
Kingpin Angle—60, 60S, 4° - $51'$; 65 and 75, 5° - $38'$.
Tie Rod Adj.—Threaded.

REAR AXLE

Type—Own, semi-floating, hypoid.
Pinion Bearing Type—60, 160S, Timken, No. 1422450 and No. 1422451; 65 and 75, Timken No. 1426641 and No. 1423389.
Adjustment—Shims.
End Play—Not given.
Lash—.004"-, .008".
Diff. Bearing Type—Timken 60, 60S, No. 14193554; 65 and 75, Timken No. 1423548.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—60, 60S, 5 pts.; 65 and 75, 6 pts.

TRANSMISSION

Make and Type—Own, 3-speed, helical gears.
Main Shaft Bearing Type and No.—N. D. Ball No. 47508 and 47508-7.
Countershaft Bearing Type and No.—Needle bearing.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size—60, 60S, $25\frac{7}{8}^{\prime\prime}$ $\times 2\frac{1}{4}^{\prime\prime}$ $\times \frac{3}{16}^{\prime\prime}$; 65, $25\frac{7}{8}^{\prime\prime}$ $\times 2\frac{1}{4}^{\prime\prime}$ $\times \frac{3}{16}^{\prime\prime}$; 75, $27\frac{1}{4}^{\prime\prime}$ $\times 2\frac{1}{4}^{\prime\prime}$ $\times \frac{3}{16}^{\prime\prime}$.
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—60, 6S and 75, 54½% rear; 75, 57% front, 43% rear.

CLUTCH

Type—Long, semi-centrifugal.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. Ball No. 7502.
Throwout Bearing Type and No.—Bearings Co. C.T.D.S No. 56.

SPRINGS

Type Front—Helical (coil).
Type Rear—Semi-elliptic.
Shackle Adjustment—60, 60S, thread; 65 and 75, thread and rubber.

STEERING GEAR

Type—Saginaw worm and double tooth roller.
Adjustments—Column end play—adj. screw.
Cross-shaft adj. screw mesh—eccentric.
Lubricant—Not given.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy—727V.
Drive—Solenoid shifted gear.
Rotation—Clockwise, viewing pinion.
No. Load—65 amps., 5 volts, 5500 r.p.m.
Lock Torque—16 ft. lbs., 600 amps., 3.0 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy, 60, 60S, No. 1101051.
Delco-Remy, 65, No. 1101054.
Delco-Remy, 75, No. 1102652.
Drive— $\frac{3}{4}$ " Vee belt, $47\frac{3}{4}^{\prime\prime}$ long.
Regulation—60, 60S, 65, voltage regulation; 75, voltage and current regulation.
Thermostat—None.
Max. charge rate 26 amps., max. ser., 75, 28-30 amps., max. series 60, 60S, 75.
Due to voltage regulation actual charging rate is controlled by state of charge of battery.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—60, 60S, 65, 6.5-7 volts; 75, 6.8-7 volts.
Amps. Discharge to Open—60, 60S, 65, 0-3;
75, 0-2.
Field Fuse—None.

IGNITION

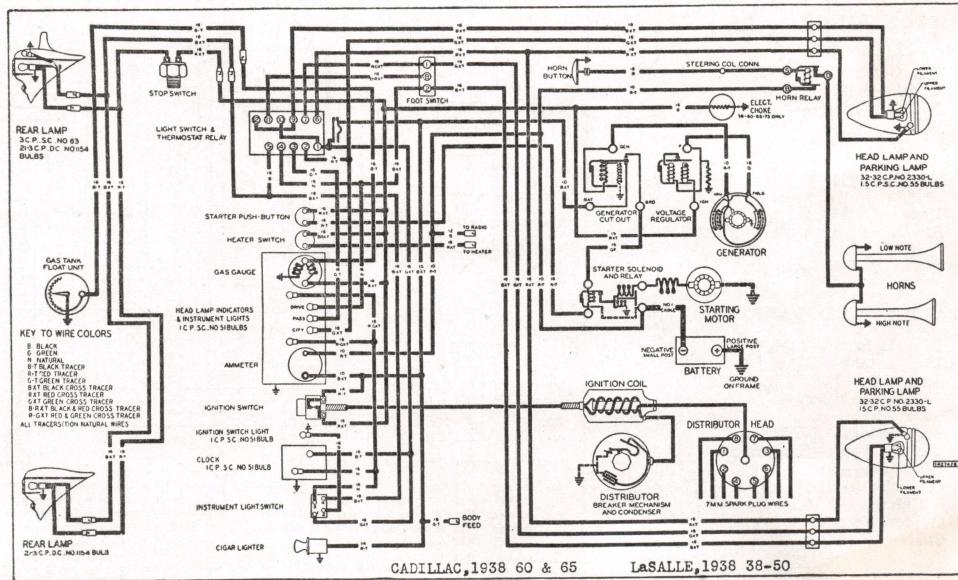
Distributor—Delco-Remy—665G.
Coil—Delco-Remy—539C.
Distr. Rotation—Clockwise.
Breaker Gap—.0125"-, .0175".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025"-, .030".
Spark Plug Size—14 m/, A. C. No. 45.
Manual Advance—20°.
Automatic Advance—22°.
Vacuum Advance—None.
Timing—5 degs. before top dead center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—60, 60S, 65, 110 amp. hr.; 75, 130 amp. hr.

LAMPS

Head—No. 2330-L.
Park—No. 55 in headlamps.
Instrument and Indicators—No. 51.
Fuse—Not given.
Dome—No. 81.
Stop and Tail—No. 1154 and No. 63.



Cadillac V-16, 1938

SERIES 38-90

ENGINE

DATA

No. of Cylinders—16 (135°V.).
Bore— $3\frac{1}{4}$ ".
Stroke— $3\frac{1}{4}$ ".
Taxable H. P.—67.60.
Displacement—431.0 cu. in.
Firing Order—1-4-9-12-3-16-11-8-15-14-7-6-13-2-5-10.
Front—2-4-6-8-10-12-14-16-1-3-5-7-9-11-13-15.
Max. H. P.—185 at 3600 r.p.m.

CAMSHAFT

Drive—Morse, Type C, No. 3682R.
Chain Data—62 links, $1\frac{1}{4}$ " wide, $\frac{3}{16}$ " pitch.
Valve Timing—Sprocket marks directly opposite each other.
Bearings—5.
End Thrust Taken On—Front end.
Bearing Clearance—.002"--.003".

CONNECTING RODS

End Clearance—.0045"--.0075".
Dia. Clearance—.0010"--.0025".

COOLING SYSTEM

Capacity— $7\frac{1}{2}$ gals.
Pump Drive—Two Vee belts (two pumps).
Belt Size—V, $49\frac{5}{8}$ " x $\frac{5}{8}$ ".
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—9.
Material—Steel-backed babbitt.
End Thrust Taken On—Center No. 5 bearing.
End Clearance—.001"--.005".
Dia. Clearance—.0015".

FUEL SYSTEM

Carburetor Make—(2) Carter, L. H., 407S; R. H., 408S.
Type— $1\frac{1}{8}$ ", downdraft dual.
Adjustment—Idle adjustment, $\frac{1}{4}$ to 1 turn open.
Fuel Delivery—Two A. C. camshaft pumps.

LUBRICATION

Type—Pressure.
Pump Type—Helical gear.
Capacity—11 qts.
Oil Pressure—25 lbs. at 30 m.p.h.
Adjustment—None.
Winter Oil—0°-32°, 20W; below zero, 10W.
Summer Oil—Moderate speeds, 30; high speed, 40-50.

PISTONS

Material — Alum. alloy, T-slot, anodized finish.
Clearance—Top—.0196".
Clearance—Bottom—.0015"--.002".

PISTON RINGS

Gap—.007"--.015", all rings.
No. Comp. Rings—2.
Width—One $\frac{1}{16}$ ", one $\frac{3}{32}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.00035" clearance.
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust—1.370"-1.380".
Dia. Intake—1.495"-1.505".
Stem Dia.—Int., .3415 -.3425 ; Exh., .3405"-3415".
Seat Angle—45°.
Seat Width— $\frac{5}{64}$ ".
Tappet Type—Cylindrical.
Clearance—Hot: Intake—Automatic.
Exhaust—Automatic.
Guides Removable—Yes.
Spring Pressure—49 lbs. at 1.8125" ($1\frac{13}{16}$ ").
 $95\frac{1}{2}$ lbs. at 1.5225". Free length 2.130".

CHASSIS

FRONT AXLE

Caster—0° + or $-\frac{1}{4}$ °.
Camber—0°- $\frac{1}{2}$ °.
Toe-in—Car in motion, 0"- $\frac{1}{16}$ "; at rest, $\frac{1}{32}$ "- $\frac{3}{32}$ ".
Kingpin Angle—5° 38'.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Timken No. 1426441 and No. 1423389.
Adjustment—Shims.
End Play—Not given.
Lash—.004"--.008".
Diff. Bearing Type—Timken No. 1423548.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Own, 3-speed, helical gear.
Main Shaft Bearing Type and No.—N. D. Ball No. 47508 and No. 47508-7.
Countershaft Bearing Type and No.—Needle bearing.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $12\frac{15}{16}$ " x $2\frac{3}{4}$ " x $\frac{1}{4}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—57% front; 43% rear.

CLUTCH

Type—Long.
Facing Type—Woven.
Billet Bearing Type and No.—N. D. Ball No. 7502.
Throwout Bearing Type and No.—N. D. Ball No. C. T.-34.

SPRINGS

Type Front—Helical (coil).
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread and rubber.

STEERING GEAR

Type—Saginaw worm and double tooth roller.
Adjustments
Column end play—adjusting screw.
Cross-shaft—adjusting screw.
Mesh—eccentric.
Lubricant—Special steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy No. 000714 (6 pole).
Drive—Solenoid shifted gear.
Rotation—Not given.
No Load—65 amps., 5.0 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63 volts.
Brush Spring Tension—Not given.

GENERATOR

Make—Delco-Remy No. 1102651.
Drive—Friction drive from fan pulley.
Regulation—Current and voltage regulation.
Thermostat—None.
Output—26 amps. max. charge rate. Due to voltage regulation actual charging rate is controlled by state of charge of battery.
Brush Spring Tension—Not given.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.8 to 7.3 volts.
Amps. Discharge to Open—0-2.
Field Fuse—None.

IGNITION

Distributor—(2) Delco-Remy No. 1110601 L. H. and 1110602 R. H.
Coil—Delco-Remy 553E (two).
Distr. Rotation—Not given.
Breaker Gap—.0125"--.0175".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.032".
Spark Plug Size—14 m/m A.C. No. 45 (blue top).
Manual Advance—20°.
Automatic Advance—28°.
Vacuum Advance—None.
Timing—6 degs. before top dead center.
“IGA” mark on harmonic balancer.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—Delco, 164 amp. hr.

LAMPS

Head—No. 2330L.
Park—No. 55.
Instrument—No. 51.
Fuse—Not given.
Dome—Not given.
Stop and Tail—No. 1154 and No. 63.

Cadillac V-8 1937

SERIES 60, 65, 70 & 75

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—39.20.
Displacement—346.0 cu. in.
Firing Order—1-8-7-3-6-5-4-2.
Max. H. P.—135 at 3400 r.p.m.

CAMSHAFT

Drive—Morse 3862-RX chain.
Chain Data—62 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Check to flywheel marking.
Bearings—4.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0025"--.0037".

CONNECTING RODS

End Clearance—.003"--.006".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $6\frac{1}{4}$ gals.
Pump Drive—Belt.
Belt Size— $34^{\circ}V$.
Belt Adjustment— $11\frac{1}{2}$ " C to C $x 1\frac{1}{4}$ ".
Pump Pack Adjustment—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Babbitt, bronze-backed.
End Thrust Taken On—Center bearing.
End Clearance—.001"--.005".
Dia. Clearance—.0015".

FUEL SYSTEM

Carburetor Make—Stromberg "AA-25."
Type—Dual downdraft.
Adjustment—Turn in for lean; out for rich mixture.
Fuel Delivery—A. C. mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—30 lbs. at 60 m.p.h.
Adjustment—None.
Oil { Summer—Moderate speeds, S.A.E. 30;
high speeds, S.A.E. 40-50.
Winter— 0° - 32° S.A.E. 20W; below zero, S.A.E. 10W.

PISTONS

Material—Bohn Lo-Ex alum. alloy, anodized finish.
Clearance—Top—.025".
Clearance—Bottom—.0021".

PISTON RINGS

Gap—Comp., .007"-.012"; Oil, .007"-.015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0004 press one end, other .0000" clearance.
Fit in Rod—.0002"--.0008".

VALVES AND TAPPETS

Dia. Exhaust— $1.626^{\prime\prime}$ - $1.636^{\prime\prime}$.
Dia. Intake— $1.876^{\prime\prime}$ - $1.886^{\prime\prime}$.
Stem Dia.—Int. $.3415^{\prime\prime}$ - $.3425^{\prime\prime}$;
Exh., $.3405^{\prime\prime}$ - $.3415^{\prime\prime}$.
Seat Angle— 45° .
Seat Width—Int. $\frac{1}{16}$; Exh. $\frac{5}{64}$ ".
Tappet Type—Mushroom.
Clearance—Hot: Intake—Automatic adjustment.
Exhaust—Automatic adjustment.
Guides Removable—Yes.
Spring Pressure—66 lbs. at $1.926^{\prime\prime}$.
145 lbs. at $1.581^{\prime\prime}$.

CHASSIS

FRONT AXLE
Caster—Series 60— $1\frac{1}{4}^{\circ}$ + $1\frac{1}{4}^{\circ}$; Series 65, 70 and $75-0^{\circ}+1\frac{1}{4}^{\circ}$.
Camber—Series 60— $1\frac{1}{4}^{\circ}-1^{\circ}$; Series 65, 70 and $75-0^{\circ}-\frac{1}{2}^{\circ}$.
Toe-in— $0^{\circ}-\frac{1}{16}^{\circ}$.
Kingpin Angle—Series 60— $4^{\circ}-51'$; Series 65, 70 and $75-5^{\circ}-38'$.
Tie Rod Adj.—Thread.

REAR AXLE
Type—Semi-floating: Series 60, hypoid;
Series 65, 70 and 75, spiral bevel.
Pinion Bearing Type—Series 60—N. D. Ball
No. 5306SC and Hyatt No. 1287465.
Series 65, 70 and 75—N. D. Ball No. 5307
and Hyatt No. 1287465.
Bearing Adjustment—None; pinion adjustment, shims.
End Play—Not given.
Lash—.004"--.008".
Diff. Bearing Type—Timken.
Adjustment—Thread.
End Play—Not specified.
Lubricant Capacity—Housing— $2\frac{1}{2}$ qts.

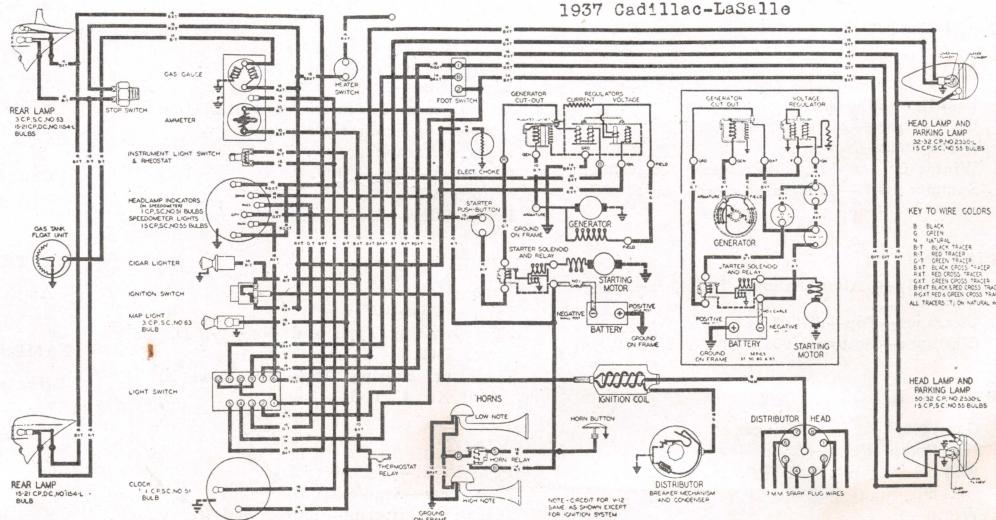
TRANSMISSION
Make and Type—Own, helical gear.
Main Shaft Bearing and No.—N. D. No.
47508.
Countershaft Bearing Type and No.—Needle bearing.

BRAKES
Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size—Series 60, 65 and 70— $25\frac{7}{8}^{\prime\prime} \times 2 \times \frac{3}{16}^{\prime\prime}$; Series 75— $30^{\prime\prime} \times 2\frac{1}{4}^{\prime\prime} \times \frac{1}{4}^{\prime\prime}$.
Adjustments
Eccentric for centralizing adjusting screw for clearance.
Sliding anchor adjustment.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—
Series 60— $54\frac{1}{2}\%$ front, $45\frac{1}{2}\%$ rear.
Series 65 and 70— 56% front, 44% rear.
Series 75— 58% front, 42% rear.

CLUTCH
Type—Long single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. 7502.
Throwout Bearing Type and No.—N. D. CT 30F.

SPRINGS
Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Series 60, thread; Series 65, 70 and 75, rubber.

STEERING GEAR
Type—Worm and double roller.
Adjustments—Column end play—adjusting nut at bottom.
Cross-shaft end play—adjusting screw.
Mesh—Eccentric bearing mounting.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 727V (4-pole).
Drive—Solenoid operated gear.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts, 5500 r.p.m.
Lock Torque—16 ft. lbs., 600 amps., 3.0 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy, Series 60 and 65, No. 918C; 70 and 75, 961K.
Drive— $40^{\circ}V$ -belt.
Regulation—Voltage regulation.
Thermostat—None.
Output, cold—28-30 amps. max. cold.
Output, hot—Depends on battery condition.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—Series 60 and 65—6.5-7.0 volts.
Series 70 and 75—6.8-7.3 volts.
Amps Discharge to Open—
Series 60 and 65—6.5-7.0 volts.
Series 70 and 75—6.8-7.3 volts.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 665-G.
Coil—Delco-Remy 539-C.
Distr. Rotation—Clockwise.
Breaker Gap— $0.125^{\prime\prime}$ - $0.175^{\prime\prime}$.
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025"--.027".
Spark Plug Size—A. C. "K-7" 14 m/m.
Manual Advance— 20° .
Automatic Advance— 22° .
Timing— 5° before top center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps—Series 60—110 amp. hr.
Series 65, 70 and 75—130 amp. hr.

LAMPS

Head—R. H., 32-50 C. P.; 32-32 C. P., L. H.
Park—No. 55.
Instrument—No. 55, No. 63 and No. 51.
Fuse—None.
Stop and Tail—No. 1154 and No. 63.

1937 Cadillac-LaSalle



Cadillac V-12, 1937

SERIES 85

ENGINE

DATA

No. of Cylinders—12.
Bore— $3\frac{1}{8}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—46.9.
Displacement—368 cu. in.
Firing Order—1-4-9-8-5-2-11-10-3-6-7-12.
Max. H. P.—150 at 3600 r.p.m.

CAMSHAFT

Drive—Morse No. 766 Duplex chain.
Chain Data—110 links, $1\frac{1}{2}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Check to flywheel marking.
Bearings—4, replaceable.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0015"--.0026".

CONNECTING RODS

End Clearance—.004"--.007".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $4\frac{1}{4}$ gals.
Pump Drive—Chain.
Belt Size— $34^{\circ}V$ C to C $13\frac{3}{4}$ " x $\frac{7}{8}$ ".
Belt Adjustment—Fan mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt, steel-backed.
End Thrust Taken On—No. 3 bearing.
End Clearance—.001"--.005".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Detroit Model 51.
Type—Two single carburetors.
Adjustment—Idle adjustment only.
High speed, fixed jets.
Fuel Delivery—A. C. mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—9 qts.
Oil Pressure—30 lbs. at 60 m.p.h.
Adjustment—None.
Oil { Summer—Moderate speeds, S.A.E. 30;
high speeds, S.A.E. 40-50.
Winter— 0° - 30° S.A.E. 20W; below
zero, 10W.

PISTONS

Material—Lynite Lo-Ex. alum. alloy, anodized finish.
Clearance—Top—.019".
Clearance—Bottom—.002".

PISTON RINGS

Gap—Comp., .007"-.012"; Oil, .007"-.015".
No. Comp. Rings—3.
Width—.093"-.0935".
No. Oil Rings—1.
Width—.1540"-.1550".

PISTON PINS

Type—Locked in piston.
Fit in Piston—.0004" press locked end; .0000" in other end.
Fit in Rod—Not specified.

VALVES AND TAPPETS

Dia. Exhaust— $1.384^{\prime\prime}$ - $1.390^{\prime\prime}$.
Dia. Intake— $1.509^{\prime\prime}$ - $1.515^{\prime\prime}$.
Stem Dia.— $.3392^{\prime\prime}$ - $.3397^{\prime\prime}$.
Seat Angle— 45° .
Seat Width— $\frac{5}{64}$ ".
Tappet Type—Roller.
Clearance—Hot: Intake—None.
Exhaust—None. (automatic).
Guides Removable—Yes.
Spring Pressure—
Outer—50 lbs. at 1.922"
Inner—19.5 lbs. at 1.751"
Outer—115.5 lbs. at 1.578"
Inner—51.5 lbs. at 1.407"

CHASSIS

FRONT AXLE

Caster— 0° + $\frac{1}{4}$ °.
Camber— 0° $-\frac{1}{2}$ °.
Toe-in—.0"-.16".
Kingpin Angle— 5° $38'$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—N. D. No. 5307 and Hyatt No. 1287465.
Bearing Adjustment—None; pinion adjustment, shims.
End Play—Not specified.
Lash—.004"-,.008".
Diff. Bearing Type—Timken.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Own, constant mesh helical gear.
Main Shaft Bearing Type and No.—N. D. No. 47508.
Countershaft Bearing Type and No.—Needle bearing.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded on primary, woven on secondary shoe.
Lining Size { $30^{\prime\prime}$ x $2\frac{1}{4}$ " x $\frac{1}{4}$ " on rear.
 $27\frac{1}{4}$ " x $2\frac{1}{4}$ " x $\frac{1}{4}$ " on front.
Adjustments
Eccentric for centralizing.
Adjusting screw for clearance.
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—58% front, 42% rear.

CLUTCH

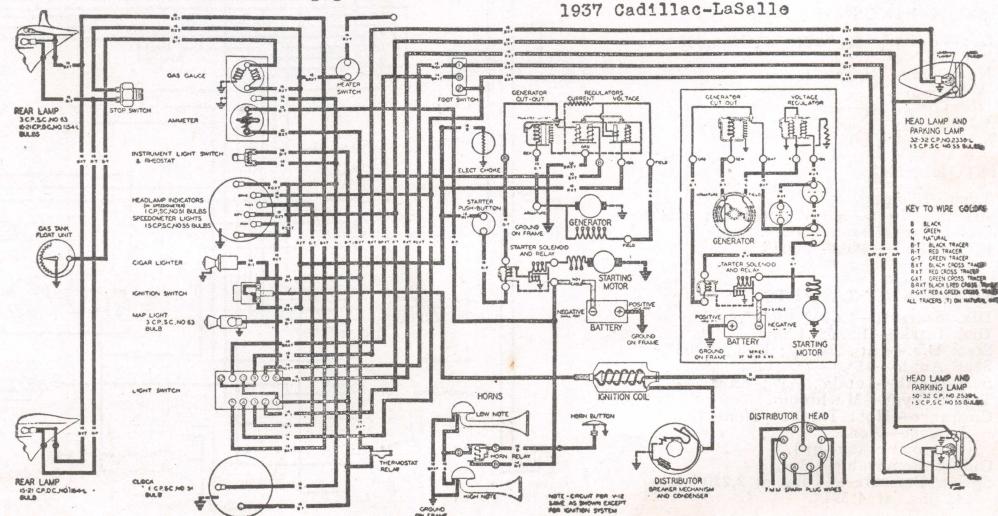
Type—Long single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. No. 7202.
Throwout Bearing Type and No.—N. D. No. CT-30-F.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Saginaw worm and double roller.
Adjustments—Column end play—nut under bottom cover.
Cross-shaft end play—adjusting screw.
Mesh—Eccentric sleeve.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy No. 580 (6-pole).
Drive—Solenoid gear.
Rotation—Counter-clockwise, viewing drive end.
No Load—70 amps., 5.7 volts, 2200 r.p.m.
Lock Torque—35 ft. lbs., 600 amps., 3 volts.
Brush Spring Tension—36-40 oz.

GENERATOR

Make—Delco-Remy No. 933M.
Drive—Chain.
Regulation—Current-voltage regulator.
Thermostat—None.
Output—Max. 26 amps., rate depends upon condition of battery. Charge rate constant at all speeds above 20 m.p.h.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.75 to 7.25 volts.
Amps. Discharge to Open—0-2.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 667-C.
Coil—Delco-Remy 553-E.
Distr. Rotation—Counter-clockwise, viewing drive end.
Breaker Gap—.018"-,.024".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025"-,.027".
Spark Plug Size—A. C. "G7", 18 m/m.
Manual Advance— 20° .
Automatic Advance— 38° .
Timing— 10° before top dead center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—160 amp hrs.

LAMPS

Head—R. H., 32-50 C. P.; L. H., 32-32 C. P.
Park—No. 55.
Instrument—No. 63. No. 55 and No. 51.
Fuse—None.
Stop and Tail—No. 1154 and No. 63.

1937 Cadillac-LaSalle

Cadillac V-8, 60

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—36.45.
Displacement—322.0 cu. in.
Firing Order—1-8-7-3-6-5-4-2.
Max. H. P.—125 at 3400 r.p.m.

CAMSHAFT

Drive—Morse No. 3377.
Chain Data—62 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Check to flywheel marking.
Bearings—4.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0025"—.0037".

CONNECTING RODS

End Clearance—.003"—.006".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $7\frac{1}{2}$ gals.
Pump Drive—Belt.
Belt Size— $34^{\circ}V$, 1" wide.
Belt Adjustment—Fan mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Babbitt, bronze backed.
End Thrust Taken On—Center bearing.
End Clearance—.001"—.005".
Dia. Clearance—.0015".

FUEL SYSTEM

Carburetor Make—Stromberg "E. E. 24."
Type—Downdraft.
Adjustment—Ide adjustment only.
High speed, fixed jet.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—30 lbs. at 60 m.p.h.
Adjustment—None.

Oil { Summer—Moderate speeds, S.A.E. No. 30.
High speeds, S.A.E. No. 40-50-60.
Winter— 0° - 32° S.A.E. No. 20W.
Below 0° , S.A.E. No. 10W.

PISTONS

Material—Lo-Ex. alum. alloy, T-slot,
anodized.
Clearance—Top—.023".
Clearance—Bottom—.0019".

PISTON RINGS

Gap—Comp., .007"—.012"; Oil, .007"—
.015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0004" press fit one
end; no clearance other end.
Fit in Rod—.0002"—.0008".

VALVES AND TAPPETS

Dia. Exhaust— $1.626^{\prime\prime}$ - $1.636^{\prime\prime}$.
Dia. Intake— $1.876^{\prime\prime}$ - $1.886^{\prime\prime}$.
Stem Dia.—Int., .3415"; Exh., .3405".
Seat Angle—45°.
Seat Width—Intake, $\frac{1}{16}$ "; Exh., $\frac{5}{64}$ ".
Tappet Type—Mushroom.
Clearance—Hot: Intake—None.
Exhaust—None.
(Automatic take-up).
Guides Removable—Yes.
Spring Pressure—66 lbs. at 2.210".
143 lbs. at 1.591".

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}^{\circ}$ - 2° .
Camber— $\frac{1}{4}^{\circ}$ - 1° .
Toe-in— $0^{\prime\prime}$ - $\frac{1}{16}^{\prime\prime}$.
Kingpin Angle— 4° - $51'$.
Tie-rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Ball and straight roller.
Adjustment—Shims.
End Play—Not specified.
Lash—.004"—.008".
Diff. Bearing Type—Timken taper roller.
Adjustment—Thread.
End Play—Not specified.
Lubricant Capacity—Housing— $2\frac{1}{2}$ qts.

TRANSMISSION

Make and Type—Own, synchro-mesh.
Main Shaft Bearing Type and No.—N. D. No. 47507 and 43306.
Countershaft Bearing Type and No.—Hyatt, No. 92424.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded and woven.
Lining Size— $25\frac{1}{2}$ x 2" x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Sliding type anchor.
Clearance
Top—.010".
Bottom—.010".
Brake Effort—56% front, 44% rear.

CLUTCH

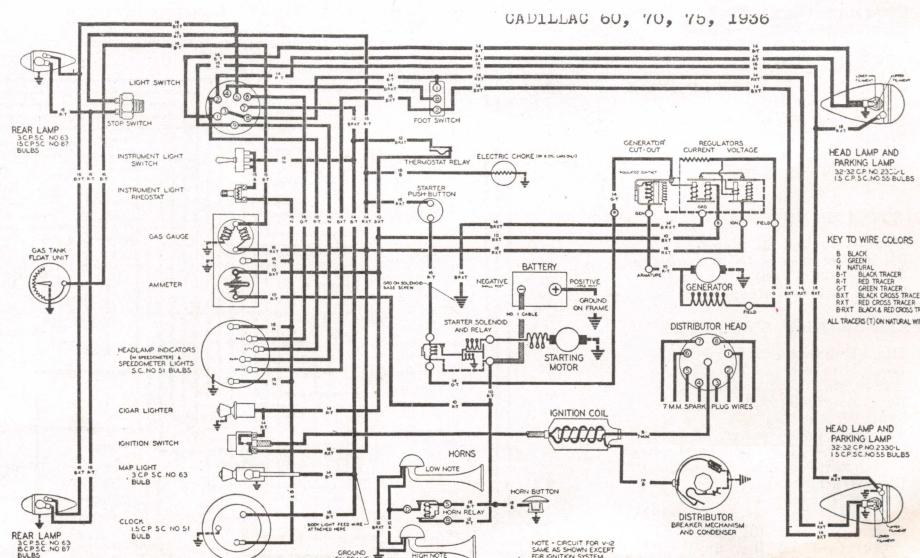
Type—Long single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. Ball No. 7202.
Throwout Bearing Type and No.—N. D. Ball C. T. 34.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Worm and double roller.
Adjustments
Column end play—adjusting nut bottom.
Cross-shaft—adjusting screw.
Mesh—eccentric.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 727-V.
Drive—Solenoid-operated gear.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 6 volts, 5500 r.p.m.
Lock Torque—16 ft. lbs., 3 volts, 600 amps.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco—961-D.
Drive—28" V-belt, $127\frac{1}{2}^{\prime\prime}$ x $4\frac{1}{4}^{\prime\prime}$.
Regulation—Voltage and current regulation.
Thermostat—None.
Output, cold—22 amps., 8.1-8.3 volts at 1900 r.p.m.
Output, hot—Not specified.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.8 to 7.3 volts.
Amps. Discharge to Open—0-2.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 665-D.
Coil—Delco-Remy 539-C.
Distr. Rotation—Clockwise, viewing drive end.
Breaker Gap—.0125"—.0175".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025"—.027".
Spark Plug Size—A. C. "K7," 14 m/m.
Manual Advance— 20° .
Automatic Advance— 22° .
Vacuum Advance— 15° .
Timing— 5° before top dead center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps—110 amp. hr., Delco.

LAMPS

Head—No. 3001.
Park—No. 63.
Instrument—No. 63.
Fuse—None specified.
Dome—No. 81.
Stop and Tail—No. 87.

CADILLAC 60, 70, 75, 1936



Cadillac V-12, 80 and 85

ENGINE

DATA

No. of Cylinders—12.
Bore— $3\frac{1}{4}$ ".
Stroke—4".
Taxable H. P.—46.9.
Displacement—368.0 cu. in.
Firing Order—1-4-9-8-5-2-11-10-3-6-7-12.
Max. H. P.—150 at 3600 r.p.m.

CAMSHAFT

Drive—Morse No. 766 Duplex.
Chain Data—110 links, $1\frac{1}{2}$ " wide, $\frac{3}{4}$ " pitch.
Valve Timing—Check to flywheel marking.
Bearings—4.
End Thrust Taken On—Front end.
Bearing Clearance—.0011"--.0026".
Bearing Clearance—.0011"--.0026".

CONNECTING RODS

End Clearance—.004"--.007".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $4\frac{3}{4}$ gals.
Pump Drive—Chain.
Belt Size— $34^{\circ}V$ — $14\frac{1}{4}$ " C. to C. x $\frac{7}{8}$ " wide.
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt, steel back.
End Thrust Taken On—No. 3 bearing.
End Clearance—.001"--.005".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Detroit.
Type—(2) updraft, expanding vane.
Adjustment—Idle adjustment only.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—9 qts.
Oil Pressure—30 lbs. at 60 m.p.h.
Adjustment—None.
Winter Oil—S.A.E. No. 20.
Summer Oil—S.A.E. No. 40-50.

PISTONS

Material—Lo-Ex. alum. alloy, T-slot, anodized.
Clearance—Top—.019".
Clearance—Bottom—.002".

PISTON RINGS

Gap—Comp., .007"-.012"; Oil, .007"-
.015".
No. Comp. Rings—3.
Width— $\frac{3}{32}$ ".
No. Oil Rings—1.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Locked in piston.
Fit in Piston—.0004" press in locked end; .0000" clearance free end.
Fit in Rod—.0002"--.0008".

VALVES AND TAPPETS

Dia. Exhaust— $1.384"$ — $1.390"$.
Dia. Intake— $1.509"$ — $1.515"$.
Stem Dia.— $1\frac{1}{32}$ ".
Seat Angle— 45° .
Seat Width— $\frac{5}{16}$ ".
Tappet Type—Roller.
Clearance—Hot: Intake—None.
Exhaust—None.
(Automatic adjustment).
Guides Removable—Yes.
Spring Pressure
69 lbs.—Outer spring, 1.922".
Inner spring, 1.751".
167 lbs.—Outer spring, 1.578".
Inner spring, 1.407".

CHASSIS

FRONT AXLE

Caster— $3\frac{1}{4}^{\circ}$ — $4\frac{1}{4}^{\circ}$.
Camber— -0° — $\frac{1}{2}^{\circ}$.
Toe-in— 0 — $\frac{1}{16}$ ".
Kingpin Angle— 5° — 38° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Ball and straight roller.
Adjustment—Shim.
End Play—Not specified.
Lash—.004"—.008".
Diff. Bearing Type—Timken taper roller.
Adjustment—Thread.
End Play—Not specified.
Lubricant Capacity—Housing— $2\frac{1}{2}$ qts.

TRANSMISSION

Make and Type—Own, synchro-mesh.
Main Shaft Bearing Type and No.—N. D. 47511 and 47608.
Countershaft Bearing Type and No.—N. D. 3206 and 47507.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded and woven.
Lining Size— $30"$ x $2\frac{1}{4}"$ x $\frac{1}{4}"$.
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Sliding anchor.
Clearance
Top—.010".
Bottom—.010".
Brake Effort—58% front, 42% rear.

CLUTCH

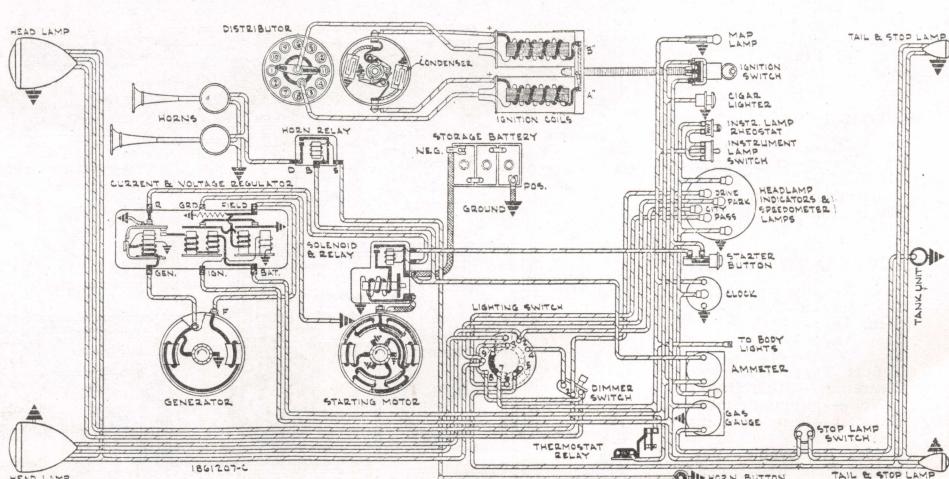
Type—Long dry plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. ball, 7202.
Throwout Bearing Type and No.—N. D. ball, C. T. 34.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Rubber and thread.

STEERING GEAR

Type—Worm and double roller.
Adjustments—Column end play—adjusting nut at bottom. Cross-shaft—adjusting screw.
Mesh—eccentric.
Lubricant—Steering gear lubricant.



CADILLAC 12, 1936
36-80 36-85

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy No. 580 (6-pole).
Drive—Solenoid gear.
Rotation—Counter-clockwise, viewing pinion.
No Load—70 amps., 5.7 volts, 2200 r.p.m.
Lock Torque—35 ft. lbs., 3 volts, 600 amps.
Brush Spring Tension—36.40 oz.

GENERATOR

Make—Delco-Remy 933-M.
Drive—Chain.
Regulation—Voltage and current regulation.
Thermostat—None.
Output, cold—22 amps., 8.1-8.3 volts, 1900 r.p.m.
Output, hot—Not specified.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing driving end.
Cutout to Close—6.75-7.25 volts.
Amps. Discharge to Open—0.2.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 667-C.
Coil—Delco-Remy 553-E.
Distr. Rotation—Not specified.
Breaker Gap—.018"—.024".
Brush Spring Tension—19.23 oz.
Spark Plug Gap—.025"—.027".
Spark Plug Size—A. C. "G6"—18 m/m.
Manual Advance— 20° .
Automatic Advance— 38° .
Vacuum Advance—None.
Timing— 10° before top center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—160 amp. hr., Delco.

LAMPS

Head—No. 3001.
Park—No. 63.
Instrument—No. 63.
Fuse—None specified.
Dome—No. 81.
Stop and Tail—No. 87.

Cadillac V-16, 1935, 1936

ENGINE

DATA

No. of Cylinders—16 V-Type.
Bore—3".
Stroke—4".
Taxable H. P.—57.5.
Displacement—452 cu. in.
Firing Order—Front—2-4-6-8-10-12-14-16.
1-3-5-7-9-11-13-15.
Max. H. P.—185 at 3800 r.p.m.

CAMSHAFT

Drive—Morse chain No. 766 Duplex.
Chain Data—110 links 1½" wide, ¾" pitch.
Valve Timing—Check to flywheel marking.
Bearings—5, replaceable.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0015".

CONNECTING RODS

End Clearance—.006"- .012".
Dia. Clearance—.0010"- .0025".

COOLING SYSTEM

Capacity—5.7 gal.
Pump Drive—Chain.
Belt Size—34°V center to center 14", ¾" wide.
Belt Adjustment—Fan mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—5.
Material—Steel backed babbitt.
End Thrust Taken On—No. 4.
End Clearance—.001"- .005".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Detroit Lubricator.
Type—Up draft—two single.
Adjustment—Idle adjustment only. High speed fixed jets.
Fuel Delivery—A. C. mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—10 qts.
Oil Pressure—30 lbs. at 60 m.p.h.
Adjustment—None.
Winter Oil—S. A. E. 20.
Summer Oil—S. A. E. 40 or 50.

PISTONS

Material—Lo-Ex. Alum. alloy, anodized finish
Clearance—Top—.018".
Clearance—Bottom—.0018".

PISTON RINGS

Gap—Comp., .007"- .012";
Oil, .007"- .015".
No. Comp. Rings—3.
Width—.093".
No. Oil Rings—1.
Width—.1545".

PISTON PINS

Type—Locked in Piston.
Fit in Piston—.0004" pressed locked end, .0000" opposite end, piston heated.
Fit in Rod—.0002"- .0008".

VALVES AND TAPPETS

Dia. Exhaust—1.384".
Dia. Intake—1.509".
Stem Dia.—1½".
Seat Angle—45°.
Seat Width—5/64".
Tappet Type—Roller.
Clearance—Hot: Intake—None—automatic take-up.
Exhaust—None—automatic take-up.
Guides Removable—Yes.
Spring Pressure—Inner 18-21 lbs. at 1¼"; 49-54 lbs. at 1.407"; center, 48-52 lbs. at 1.922"-111-120 lbs. at 1.578".

CHASSIS

FRONT AXLE

Caster—1½°.
Camber—1°.
Toe-in—7/8"-.346".
Kingpin Angle—4°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—¾" floating.
Pinion Bearing Type—N. D. 5308 and 1310.
Adjustment—Shim.
End Play—Not specified.
Lash—.004"- .008".
Diff. Bearing Type—Timken 387 and 383.
Adjustment—Thread.
End Play—Not specified.
Lubricant Capacity—Housing—3 qts.

TRANSMISSION

Make and Type—Own Synchro-mesh.
Main Shaft Bearing Type and No.—N. D. 47511 and 47608.
Countershaft Bearing Type and No.—N. D. 47507 and 3206.

BRAKES

Type—Own Huck type, power operated.
Lining Type—Woven.
Lining Size—292½" x 2". Forward shoe .245". Reverse shoe .183".
Adjustments—Cam and adjusting screw.
Anchor mounting.
Clearance—Top—.007".
Bottom—.007".
Brake Effort—60% front—40% rear.

CLUTCH

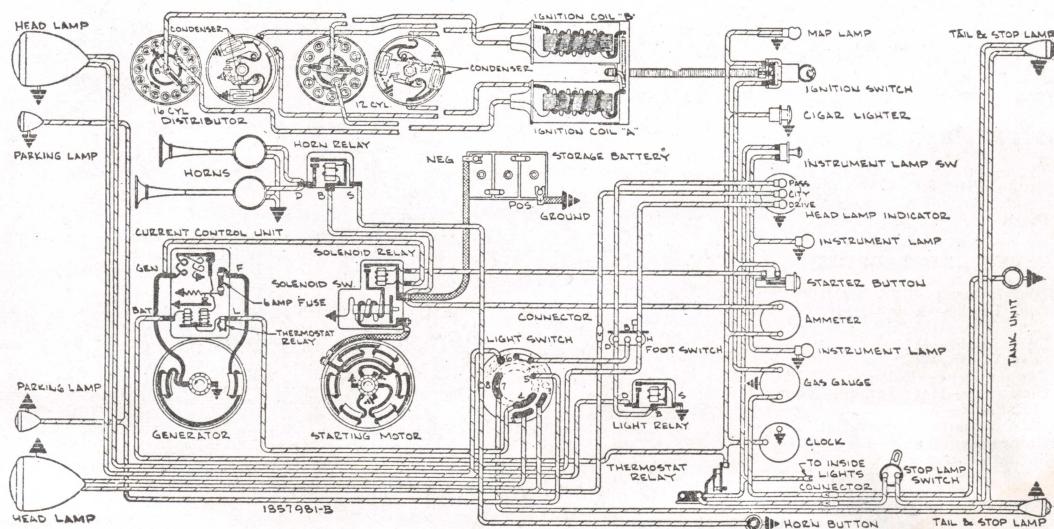
Type—Own dry plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. 7204.
Throwout Bearing Type and No.—Ball No. 2605-A.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Rubber and thread, non-adjustable.

STEERING GEAR

Type—Worm and double roller.
Adjustments—Worm shaft, nut under bottom cover; Cross shaft, adjusting screw; Mesh, eccentric sleeve.
Lubricant—Steering gear oil, S-200.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy No. 580 (6 pole).
Drive—Manual gear—solenoid shift.
Rotation—Counter-clockwise.
No Load—70 amps., 5.7 volts, 2200 r.p.m.
Lock Torque—35 ft. lbs., 600 amps., 3 volts.
Brush Spring Tension—36-40 oz.

GENERATOR

Make—Delco-Remy No. 933-C.
Drive—Chain.
Regulation—Current controlled.
Thermostat—None.
Output, cold—Lights on, 20.5 amps., lights off, 15 amps.
Output, hot—Lights on, 20.5 amps., lights off, 10 amps.
Brush Spr. Tension—20-28 oz.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.75 to 7.25 volts.
Amps. Discharge to Open—0-2 amps.
Field Fuse—6 amps.

IGNITION

Distributor—Delco-Remy No. 4118.
Coil—Delco-Remy 553-E.
Distr. Rotation—Clockwise.
Breaker Gap—.014"- .016".
Brush Spr. Tension—17-21 oz.
Sp. Plug Gap—.025"- .027".
Sp. Plug Size—A. C. G-6—18 m/m.
Manual Advance—20° engine.
Automatic Adv.—34° engine.
Timing—4° before top dead center.
Coil Amps., Engine Idling—2.2 amps.
Coil Amps., Engine Stopped—4.4 amps.

BATTERY

Amps.—Delco 190 amp. hr.

LAMPS

Head—2330-L.
Park—63-L.
Instrument—63-L.
Fuse—Not specified.
Dome—81-L.
Stop and Tail—87 and 63-L.

Chevrolet Master and DeLuxe, 1938

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{2}$ "
Stroke— $3\frac{3}{4}$ ".
Taxable H. P.—29.4.
Displacement—216.5 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—85 at 3200 r.p.m.

CAMSHAFT

Drive—Gears (.002"-.005" lash).
Chain Data—Not given.
Valve Timing—Gear marks in mesh.
Bearings—Split replaceable bushings.
End Thrust Taken On—Thrust plate front end.
Bearing Clearance—.002"-.004".

CONNECTING RODS

End Clearance—.010".
Dia. Clearance—.0017".

COOLING SYSTEM

Capacity—14 qts.
Pump Drive—Fan belt.
Belt Size— $32^{\circ}V$, $42\frac{1}{8}$ " x $1\frac{1}{16}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt, steel-backed.
End Thrust Taken On—Rear center bearing.
End Clearance—.0055".
Dia. Clearance—.003" average.

FUEL SYSTEM

Carburetor Make—Carter "W-1"
Type—Single downdrift.
Adjustment—Idle adjustment only—1 to 2 turns open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure— $13\frac{1}{2}$ lbs. at 50 m.p.h.
Adjustment—Idle, 1 to 2 turns open.
Not lower than $32^{\circ}F$. S.A.E. 20W. or 20
As low as $+10^{\circ}F$. S.A.E. 20W.
Oil { As low as $-10^{\circ}F$. S.A.E. 10W.
Below $-10^{\circ}F$. S.A.E. 10W. +
10% kerosene.

PISTONS

Material—Cast iron, tin-plated.
Clearance—Top—.0095".
Clearance—Bottom—.0022".

PISTON RINGS

Gap—All rings .010" average (.004"-.014").
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Lock in rod.
Fit in Piston—Slip fit.
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{1}{16}$ ".
Stem Dia.—.341".
Seat Angle—30°.
Seat Width— $\frac{1}{16}$ "-.
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.006" min.
Exhaust—.013" min.
Guides Removable—Yes.
Spring Pressure—45 lbs. at $1\frac{1}{8}$ ".
125-133 lbs. at $1\frac{1}{2}$ ".
Free length, $2\frac{1}{2}$ ".

CHASSIS

FRONT AXLE

Caster—Master, $1\frac{3}{4}^{\circ}$ - $2\frac{3}{4}^{\circ}$; DeLuxe, 0° .
Camber—Master, $\frac{1}{2}^{\circ}$ - $1\frac{1}{2}^{\circ}$; DeLuxe, $\frac{1}{4}^{\circ}$.
Toe-in—Master, $5\frac{1}{4}^{\prime\prime}$ - $5\frac{1}{8}^{\prime\prime}$; DeLuxe, $5\frac{1}{16}^{\prime\prime}$ - $5\frac{3}{32}^{\prime\prime}$.
Kingpin Angle—Master, $7\frac{1}{2}^{\circ}$ + 1° ; DeLuxe, $7\frac{3}{4}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—N. D. 5306 and Hyatt C1506.
Adjustment—Shims and tapered collar.
End Play—Not given.
Lash—.006".
Diff. Bearing Type—Hyatt KA 11360Z.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own, 3-speed.
Main Shaft Bearing Type and No.—N. D. 43207 and 43305.
Countershaft Bearing Type and No.—Bronze $\frac{7}{8}^{\prime\prime}$ x $1\frac{1}{16}^{\prime\prime}$.

BRAKES

Type—Own, hydraulic.
Lining Type—Moulded.
Lining Size— $22\frac{5}{8}^{\prime\prime}$ x $1\frac{3}{4}^{\prime\prime}$ x $\frac{3}{16}^{\prime\prime}$.
Adjustments—Adjusting for clearance of each shoe.
Clearance
Top { Adjust to slight drag, then back
Bottom } off 4 notches.
Brake Effort— $52\frac{1}{2}\%$ front, $47\frac{1}{2}\%$ rear.

CLUTCH

Type—Own, single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—N. D. 7109.
Throwout Bearing Type and No.—N. D.—CT 27.

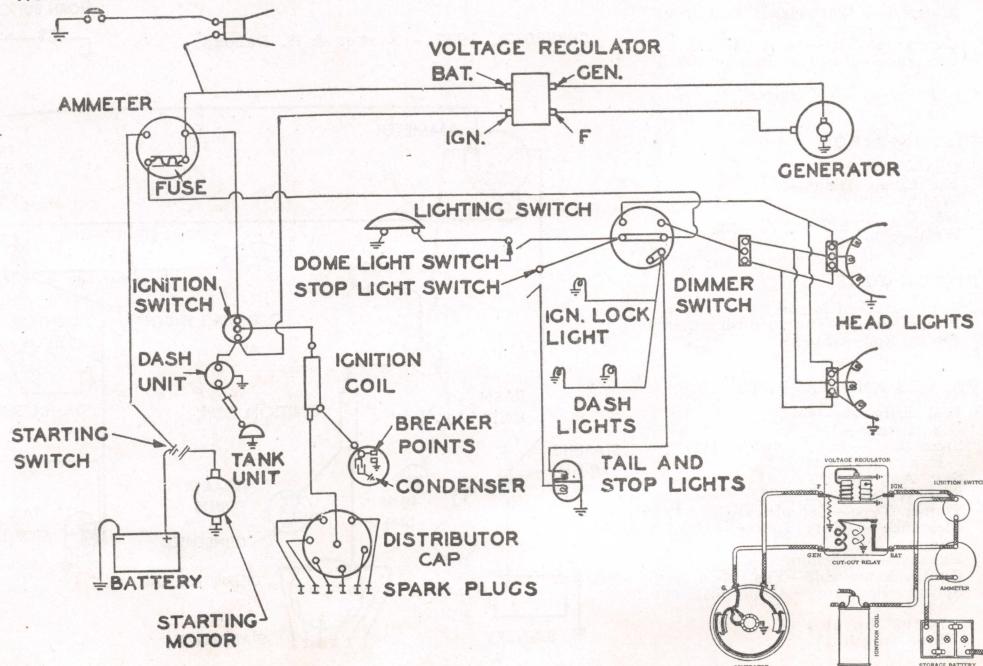
SPRINGS

Type Front—Master, Semi-elliptic; DeLuxe, coil.
Type Rear—Mast. and DeLuxe, semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Saginaw worm and roller tooth.
Adjustments
Column end play—Adjusting plug at top.
Cross-shaft end play—adjusting screw.
Mesh—eccentric.
Lubricant—Steering gear lubricant.

HORN BUTTON HORN



Chevrolet, 1937

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{2}$ ".
Stroke— $3\frac{3}{4}$ ".
Taxable H. P.—29.5.
Displacement—216.5 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—85 at 3200 r.p.m.

CAMSHAFT

Drive—Gears (lash .002"-.005").
Chain Data—Not given.
Valve Timing—Tooth marking on gears.
Bearings—4, steel-backed babbitt.
End Thrust Taken On—Free to .003" end play.
Bearing Clearance—.002"-.004".

CONNECTING RODS

End Clearance—.004" min., .012" max.
Dia. Clearance—.0005"-.002".

COOLING SYSTEM

Capacity—14 qts.
Pump Drive—Belt.
Bell Size— $32\frac{1}{2}$ V, $42\frac{1}{2}$ " x $\frac{5}{8}$ ".
Bell Adjustment—Generator mounting.
Pump Pack. Adj.—Self-adjusting.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed babbitt.
End Thrust Taken On—Rear center bearing.
End Clearance—.004"-.007".
Dia. Clearance—.002"-.004".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Downdraft single.
Adjustment—Idle adjustment one to two turns open.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure feed and dippers.
Pump Type—Gear.
Capacity—5 qts. (refill).
Oil Pressure— $13\frac{1}{2}$ lbs. at 50 m.p.h.
Adjustment—None.

Oil { Consistently above 80°F S.A.E. No. 30
Lowest temperat'e 50°F S.A.E. No. 30
Lowest temperat'e 30°F S.A.E. No. 20
Lowest temperat'e 10°F S.A.E. No. 20 W
Lowest temperat'e 10°F S.A.E. No. 10 W
Lowest temperat'e 30°F S.A.E. No. 10 W
plus 10% kerosene.

PISTONS

Material—Light weight cast iron, slipper type, plated.
Clearance—Top—.006"-.013".
Clearance—Bottom—Pass on .002" feeler.
Tight on .003" feeler.

PISTON RINGS

Gap—.004"-.014".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—Thumb push fit.
Fit in Rod—Slip fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{64}$ ".
Dia. Intake— $1\frac{1}{16}$ ".
Stem Dia. — Int. .3407" - .3417";
Exh., .3397"-.3407".
Seat Angle— 30° .
Seat Width— $\frac{1}{16}$ "-. $\frac{3}{32}$ "".
Tappet Type—Cylindrical.
Clearance—Hot: Intake — .006"
min.
Exhaust—.013" min.
Guides Removable—Yes.
Spring Pressure — 42-48 lbs. at
 $1\frac{1}{8}$."
94-102 lbs. at $1\frac{1}{16}$."
Free length $2\frac{5}{32}$ ".

CHASSIS

FRONT AXLE

Caster— $2\frac{3}{4}^\circ$ + or — $\frac{1}{2}^\circ$, De Luxe Model 0°.
Camber— 1° + or — $\frac{1}{2}^\circ$, De Luxe Model $\frac{1}{4}^\circ$.
Toe-in— $\frac{5}{64}"$ -. $\frac{1}{8}"$, De Luxe Model $\frac{1}{16}"$ -. $\frac{3}{32}"$.
Kingpin Angle — 7° - 10° + or — 1° , De Luxe Model $7\frac{3}{4}^\circ$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid gears.
Pinion Bearing Type—Ball and straight roller.
Adjustment—Thread.
End Play—Not given.
Lash—.004"-.008".
Diff. Bearing Type—Barrel type.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own, helical gears on second synchro-mesh.
Main Shaft Bearing Type and No.—N. D. 43207 and 43305.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Hydraulic.
Lining Type—Moulded.
Lining Size— $22\frac{5}{8}$ " x $1\frac{3}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Adjusting wheel for clearance.
Clearance
Top { Tighten to slight drag, then back
Bottom { off 4 notches.
Brake Effort—53% front, 47% rear.

CLUTCH

Type—Single plate.
Facing Type—Braided, moulded.
Pilot Bearing Type and No.—Ball N. D. 7109.
Throwout Bearing Type and No.—Carbon type.

SPRINGS

Type Front—Semi-elliptic, Master; coil, De Luxe.
Type Rear—Semi-elliptic, all models.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Master, worm and tractor; De Luxe, worm and roller.
Adjustments
Column end play—Jacket clamp.
Cross-shaft—adjusting screw mesh—eccentric.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy.
Drive—Bendix.
Rotation—Clockwise viewing pinion.
No Load—65 amps., 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.6 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy.
Drive—Belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—21 amps., 8.5 volts, 2400 r.p.m.
Output, hot—18 amps., 8.3 volts, 2900 r.p.m.
Brush Spring Tension—Main 22-26 oz., third 16-20 oz.
Rotation—Not given.
Cutout to Close—6-8 volts at 800 r.p.m.
armature speed.
Amps. Discharge to Open—0.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise viewing drive end.
Breaker Gap—.018".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.037"-.042".
Spark Plug Size—A. C. "K-11," 14 m/m.
Manual Advance—None.
Automatic Advance— 50° .
Vacuum Advance— 17° .
Timing—5 degrees before top dead center.
Flywheel ball behind pointer at 400 r.p.m.
Coil Amps., Engine Idling—2.5.
Coil Amps., Engine Stopped—4.8.

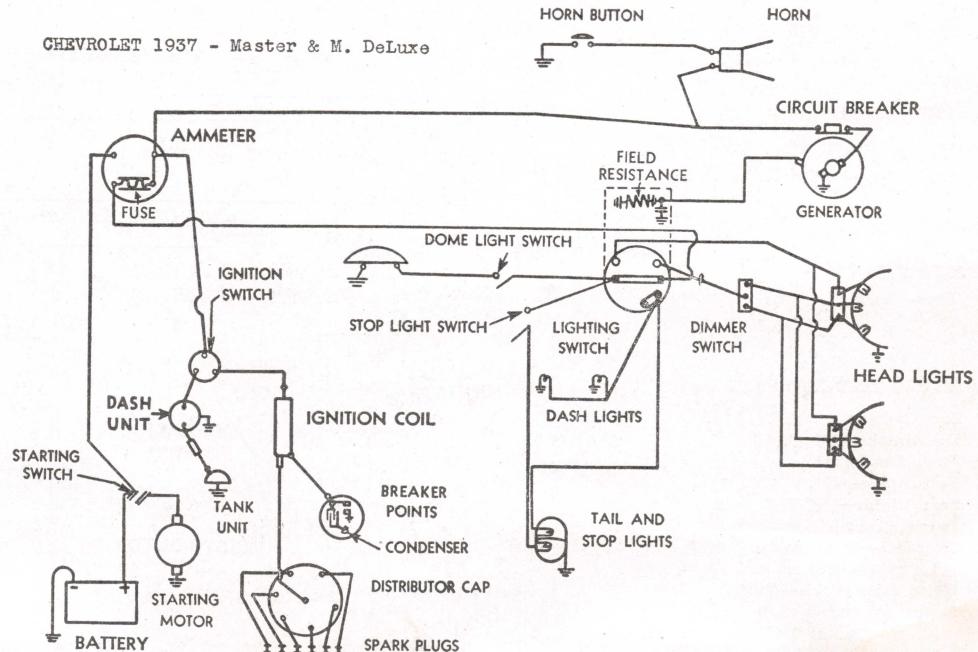
BATTERY

Amps.—100 amp. hr.

LAMPS

Head—32-21 C. P.—6-8V.
Park—3 C. P.—6-8V.
Instrument—3 C. P.—6-8V.
Fuse—15 amps.
Dome—3 C. P.—6-8V.
Stop and Tail—15 C. P. and 3 C. P.—6-8V.

CHEVROLET 1937 - Master & M. DeLuxe



Chevrolet Master 6, 1935

DeLUXE MODEL

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{5}{16}$ ".
Stroke—4".
Taxable H. P.—26.30.
Displacement—206.8 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—80 at 3200 r.p.m.

CAMSHAFT

Drive—Gears.
Chain Data—Gears.
Valve Timing—Gear marking.
Gear back lash .002"- .005".
Bearings—Clearance .002"- .004".
End Thrust Taken On—Thrust bearing front
end—End play free to .003".
Bearing Clearance—.002"- .004" center
bearing.

CONNECTING RODS

End Clearance—.004"- .011".
Dia. Clearance—.0005"- .002".

COOLING SYSTEM

Capacity— $2\frac{3}{4}$ gal.
Pump Drive—Belt.
Belt Size— $32^{\circ}V$ — $39\frac{3}{4}$ " x $2\frac{1}{2}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—3.
Material—Steel back babbitt.
End Thrust Taken On—Center bearing.
End Clearance—.004"- .007".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Down draft single.
Adjustment—Low speed $\frac{1}{2}$ - $1\frac{1}{2}$ turns open.
High speed, fixed jets.
Fuel Delivery—A. C. Mechanical pump.

LUBRICATION

Type—Pressure and splash.
Pump Type—Vane.
Capacity—5 qts.
Oil Pressure—12 lbs. at 50 m.p.h.
Adjustment—None.
Oil Recommended—Above 75°F , S. A. E. 20
 75°F to 32°F , S. A. E. 20-W.
 32°F to 15°F , S. A. E. 10-W.
 15°F and below, S. A. E. 10-W + 10%
kerosene.

PISTONS

Material—Cast iron—electro-plated.
Clearance—Top—.015".
Clearance—Bottom—.0015"- .003".

PISTON RINGS

Gap—Comp., .005"- .015"; oil, .013"-
.021".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in Rod.
Fit in Piston—Thumb push fit.
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{5}{16}$ ".
Stem Dia.— $1\frac{1}{32}$ ".
Seat Angle— 30° .
Seat Width— $\frac{1}{16}$ "— $\frac{3}{32}$ ".
Tappet Type—Cast-chilled head.
Clearance—Hot: Intake—.006" min.
Exhaust—.013" min.
Guides Removable—Yes.
Spring Pressure—45 lbs. at $1\frac{1}{8}$ ".
98 lbs. at $1\frac{1}{16}$ ".

CHASSIS

FRONT AXLE

Caster— 0° .
Camber— $\frac{1}{4}^{\circ}$.
Toe-in— $\frac{5}{64}$ "— $\frac{1}{8}$ ".
Kingpin Angle— $7\frac{3}{4}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating.
Pinion Bearing Type—N. D. 5206 and 1105
or Hyatt No. 125630.
Adjustment—Shims and tapered collar.
End Play—Not specified.
Lash—.006"— .10".
Diff. Bearing Type—N. D. Difrax No. 2100.
Adjustment—None.
End Play—.018" in bearing—none when
assembled.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Own Synchro mesh.
Main Shaft Bearing Type and No.—N. D.
3208 and 7506.
Countershaft Bearing Type and No.—Bronze
 $\frac{1}{8}$ " x $1\frac{1}{4}$ ".

BRAKES

Type—Own Huck type.
Lining Type—Semi-moulded.
Lining Size— $24\frac{3}{8}$ " x $1\frac{3}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Adjusting screw, centralizer.
Clearance—Top—Bottom—Set to rub slightly
at assembly.
Brake Effort—50-50.

CLUTCH

Type—Single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—N. D. 7109.
Throwout Bearing Type and No.—Graphite
Comp. $1\frac{1}{2}$ " x $2\frac{3}{8}$ " x $\frac{3}{4}$ ".

SPRINGS

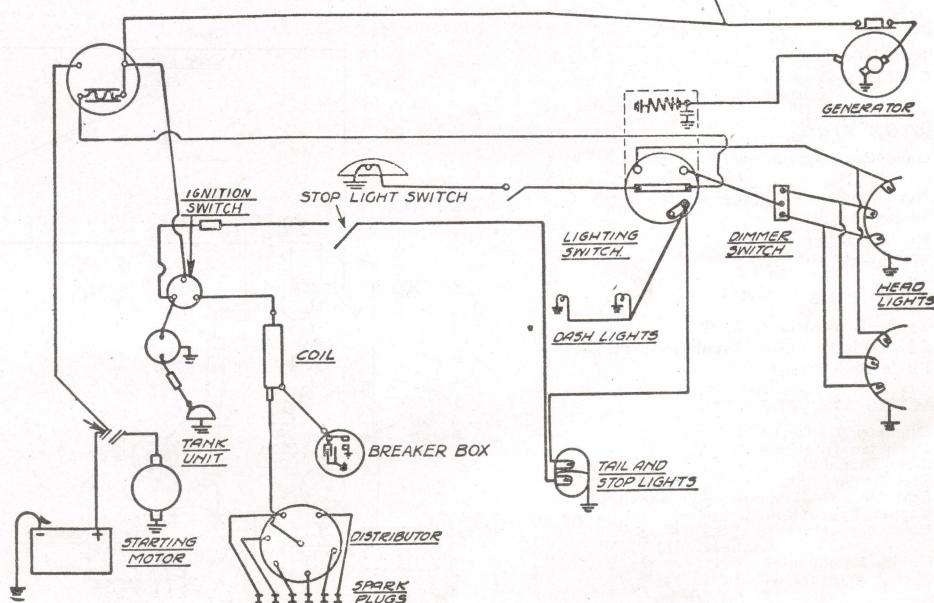
Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded, self-adjusting.

STEERING GEAR

Type—Worm and roller.
Adjustments—Worm end play—Mast jacket
clamp; Sector shaft, adjusting screw; Back
lash, eccentric bolt.
Lubricant—Steering gear lubricant every
1000 miles.

CHEVROLET Master and Standard 6, 1935

COMPLETE WIRING



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 738-G.
Drive—Bendix.
Rotation—Clockwise viewing pinion.
No Load—65 amps., 5 volts 5000 r.p.m.
Lock Torque—14 ft. lbs., 525 amps., 3.4 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 935-V.
Drive—Belt.
Regulation—Third brush and field resistance.
Thermostat—None.
Output, cold—20 amps., 8.2 volts, 2400
r.p.m.
Output, hot—17 amps., 8.2 volts, 2450 r.p.m.
26 m.p.h.
Brush Spr. Tension—(Main) 22-26 oz., (third)
16-20 oz.
Rotation—Clockwise viewing from drive end.
Cutout to Close—7.2 volts at 7.2 m.p.h.
Amps Discharge to Open—1.5 amps.

IGNITION

Distributor—Delco-Remy 645-G.
Coil—Delco-Remy 536-D.
Distr. Rotation—Counter-clockwise viewing
drive end.
Breaker Gap—.018"— .021".
Brush Spr. Tension—17-21 oz.
Sp. Plug Gap—.032"— .035".
Sp. Plug Size—A. C. K-11—14 m/m.
Manual Advance— 20° engine Vernier Man-
ual adjustment.
Automatic Adv.— 32° engine at 3000 r.p.m.
Vacuum advance 12° max.
Timing— 5° before dead center advanced.
Points to break when steel ball is opposite
pointer on flywheel housing.
Coil Amps., Engine Idling—2.5 amps.
Coil Amps., Engine Stopped—4.8 amps.

BATTERY

Amps.—Delco 90 amp. hr.

LAMPS

Head—32-21 C.P., S.C., 6-8 volt.
Park—3 C.P., S.C., 6-8 volt.
Instrument—3 C.P., S.C., 6-8 volt.
Fuse—15 amps on ammeter.
Dome—3 C.P., S.C., 6-8 volt.
Stop—15 C.P., S.C., 6-8 volt.
Tail—3 C.P., S.C., 6-8 volt.

Chevrolet, 1934, Standard 6

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{8}$ ". Stroke— $3\frac{1}{2}$ ".
Taxable H. P.—26.3.
Displacement—180.96 cu. in.
Firing Order—1-5-3-6-2-4.
Maximum H. P.—60 at 3000 r.p.m.

CAMSHAFT

Drive—Steel and fabric gears.
Valve Timing—Punch marks in line opposite each other.
Bearings—3.
End Thrust—Taken on thrust plate; free to .003" maximum end play.
Bearing Clearance—.002"-.004".

CONNECTING RODS

End Clearance—.0065"-.0135".
Diameter Clearance—.0003"-.0018".

COOLING SYSTEM

Capacity—10 quarts.
Pump Drive—Fan belt.
Belt Size— 32° V, $\frac{3}{8}$ " wide.
Belt Adjustment—Generator mounting.
Pump Packing Adjustment—Thread.

CRANKSHAFT

No. Bearings—3.
Material—Steel-backed babbitt.
End Thrust—Taken on center bearing.
End Clearance—.004"-.007".
Diameter Clearance—.001"-.003".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Downdraft.
Adjustment—Idle, $\frac{1}{2}$ to $1\frac{1}{2}$ turns open; high speed fixed.
Fuel Delivery—A. C.

LUBRICATION
Type—Pressure and splash.
Pump Type—Vane.
Capacity—5 quarts.
Oil Pressure—14 lbs. at 30 m.p.h.
Winter Oil—S. A. E. No. 10-W or 20-W.
Summer Oil—S. A. E. No. 30.

PISTONS

Material—Cast iron.
Clearance—Top, .011".
Bottom, .002"-.003" cold.

PISTON RINGS

Gap—Compression, .005"-.015";
Oil, .004"-.014".
No. Compression Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—1.
Width— $\frac{1}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—Light thumb-push fit.
Fit in Rod—Slip fit.

VALVES AND TAPPETS

Diameter Exhaust— $1\frac{1}{8}$ ".
Diameter Intake— $1\frac{3}{8}$ ".
Stem Diameter— $\frac{1}{8}$ ".
Seat Angle— 45° .
Seat Width—Minimum, $\frac{1}{8}$ "; maximum, $\frac{3}{16}$ ".
Tappet Type—Round, hollow.
Clearance—Hot: Intake, .006";
Exhaust, .013".
Guides Removable?—Yes.
Spring Pressure—40 lbs. at $1\frac{3}{4}$ ";
75 lbs. at $1\frac{1}{4}$ ".

CHASSIS

FRONT AXLE

Caster— $2^{\circ} 15'$.
Camber— $1\frac{1}{2}^{\circ}$.
Toe-in—.139" to .177".
Kingpin Angle— $7^{\circ} 10'$.
Tie Rod Adjustment—Thread.

REAR AXLE

Type—Semi-floating.
Pinion Bearing Type—N. D. Ball, 905113 and 901106.
Adjustment—Shims and tapered collar.
Lash—.006" to .010".
Differential Bearing Type—N. D. Ball, 902103.
Adjustment—Thread.
Lubricant Capacity Housing— $3\frac{1}{2}$ pints.

TRANSMISSION

Make and Type—Own, 3-speed.
Main Shaft Bearing Type and No.: N. D. 954111 and 903205.
Countershaft Bearing Type—Bronze bushing.

BRAKES

Type—G. M. C. Huck mechanical.
Lining Size— $15\frac{1}{4}$ " x $1\frac{1}{2}$ " x $\frac{1}{8}$ ".
Adjustments—Anchor, none;
Shoes, cam and lever centralizer.
Clearance—Top, set to rub slightly.
Bottom, set to rub slightly.
Brake Effort—50/50.

CLUTCH

Type—Single plate (own).
Facing Type—Braided, molded.
Pilot Bearing Type and No.—Hyatt, 142655.
Throwout Bearing Type—Molded graphite.

SPRINGS

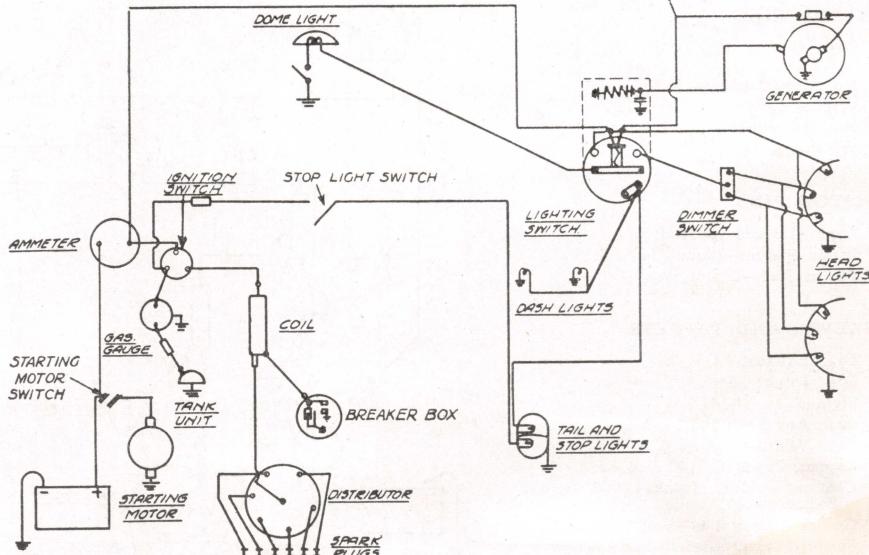
Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Self-adjusting.

STEERING GEAR

Type—Worm and sector type.
Adjustments:
Worm Shaft—Adjusting nut.
Cross Shaft—Threaded.
Gear Mesh—Eccentric shims.
Lubricant—S. A. E. No. 160.

COMPLETE WIRING

Chevrolet Standard, 1934



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy, Model 714-L.
Drive—Bendix.
Rotation—Clockwise, viewing pinion.
No Load—75 amps., 5.75 volts, 3500 r.p.m.
Lock Torque—14 ft. lbs., 420 amps., 3.75 volts.
Brush Spring Tension—24 to 28 oz.

GENERATOR

Make—Delco-Kemy, 943-J.
Drive—Fan belt.
Regulation—Third brush.
Output—Cold, 16-18 amps., 8.2 volts;
1700 r.p.m.
Hot, 12 amps., 7.6 volts.
2200 r.p.m.

Brush Spring Tension—14 to 18 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.2 volts at 7 m.p.h.
Amps. Discharge to Open—1.

IGNITION

Distributor—Delco-Remy, 622-L.
Coil—Delco-Remy, 538-C.
Distributor Rotation—Counter-clockwise, viewing drive end.
Breaker Gap—.018".
Brush Spring Tension—17 to 21 oz.
Spark Plug Gap—.032".
Spark Plug Size—A. C. "K-9," 14 mm.
Manual Advance—None.
Automatic Advance— 32° at 2700 r.p.m.,
Coil Amps., Engine Idling, 1.9 at 40 m.p.h.
vacuum advance 12".
Timing— 10° before top dead center.
Engine Stopped, 4.

BATTERY

Amps.—Delco No. 13-N, 90 amp. hr.

LAMPS

Head—Mazda, No. 2320-C.
Park—Mazda, No. 63.
Instrument—Mazda, No. 63.
Fuse—15 amps.
Dome—Mazda, No. 81.
Stop and Tail—Mazda, No. 63.

Chevrolet Master, 1934

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{5}{16}$ ". Stroke—4".
Taxable H. P.—26.3.
Displacement—194 cu. in.
Firing Order—1-5-3-6-2-4.
Maximum H. P.—80 at 3,300 r.p.m.

CAMSHAFT

Drive—Gears, .002"-.004" lash.
Valve Timing—Marks on gears in line; intake opens 4° B. T.C.
Bearings—3, center, bi-metal.
End Thrust—Taken on front bearing.
End Clearance—.003".
Bearing Clearance—.002"-.0035".

CONNECTING RODS

End Clearance—.004"-.010".
Dia. Clearance—.0005"-.002".

COOLING SYSTEM

Capacity—10½ quarts.
Pump Drive—Fan belt.
Belt Size— $2\frac{1}{2}$ " - $39\frac{1}{8}$ ".
Belt Adjustment—Generator mounting.
Pump Packing Adjustment—Thread.

CRANKSHAFT

No. Bearings—3.
Material—Bi-metal.
End Thrust—Taken on center main.
End Clearance—.004"-.006".
Dia. Clearance—.001"-.003".

FUEL SYSTEM

Carburetor Make—Carter, $1\frac{1}{4}$ ".
Type—Single, downdraft.
Adjustment—Idle only; $\frac{1}{2}$ to 1 turn open.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Combination splash and pump.
Pump Type—Vane.
Capacity—5 quarts.
Oil Pressure—14 lbs. at 30 m.p.h.
Adjustment—None.
Winter Oil—
S. A. E. No. 20.
Summer Oil—
S. A. E. No. 30.

PISTONS

Material—Cast iron,
solid skirt.
Clearance—Top, .011".
Bottom, .002".

PISTON RINGS

Gap—.014".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Clamped in rod.
Fit in Piston—
Thumb-push fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{8}$ ".
Dia. Intake— $1\frac{1}{16}$ ".
Seat Dia.—.341".
Seat Angle—45°.
Seat Width—.062"-.093".
Clearance—Hot:
Intake, .006".
Exhaust, .013".
Guides Removable?—Yes.
Spring Pressure—
45 lbs., valve closed.

CHASSIS

FRONT AXLE

Caster—0°, wheel center $\frac{3}{16}$ " behind kingpin center.
Camber—1° to 2°, car loaded.
Toe-in— $\frac{3}{16}$ " to $\frac{1}{8}$ ".
Kingpin Angle—7°.
Tie Rod Adjustment—Threaded tie rod ends.

REAR AXLE

Type—Semi-floating.
Pinion Bearing Type—N. D. 5206, 1105.
Adjustment—Shims.
Lash—.004"-.006".
Differential Bearing Type—N. D.
Adjustment—Thread.
Lubricant Capacity Housing—4½ pints.

TRANSMISSION

Make and Type—Own, syncromesh.
Main Shaft Bearing Type and No.—N. D.
3208, 7506.
Countershaft Bearing Type—Bronze.

BRAKES

Type—2-shoe mechanical (cable).
Lining Type—Molded.
Lining Size— $\frac{1}{4}$ " x $1\frac{3}{4}$ ".
Adjustments:
Anchor Pin—None.
Shoes—Cam lever and centralizer.
Clearance:
Top and Bottom—Slight drag.
Brake Effort—50/50.

CLUTCH

Type—Single plate.
Facing Type—9", molded.
Pilot Bearing Type and No.—N. D., 7502.
Throwout Bearing Type—Carbon graphite.

SPRINGS

Type Front—Coil (independent).
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded rear, rubber front.

STEERING GEAR

Type—Ball bearing, roller sector.
Adjustments:
Worm Shaft—Adjusting nut.
Cross Shaft—Threaded.
Gear Mesh—Eccentric sleeve.
Lubricant—S. A. E. No. 160.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy, No. 734-S.
Drive—Bendix and starterator.
Rotation—Clockwise, viewing from drive end.
No. Load—65 amps., 5.0 volts, 5,000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63
volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy, No. 935-B.
Drive—Fan belt.
Regulation—Third brush.
Thermostat—None.
Output—
Cold, 19 amps., 8.3 volts, 2,500 r.p.m.
Hot, 15 amps., 7.9 volts, 2,800 r.p.m.
Brush Spring Tension—Main brush, 22-26
oz.; third brush, 16-20 oz.
Rotation—Clockwise, viewing from drive end.
Cutout to Close—7.2 volts, 7 m.p.h.
Amps. Discharge to Open—1.
Field Fuse—None.

IGNITION

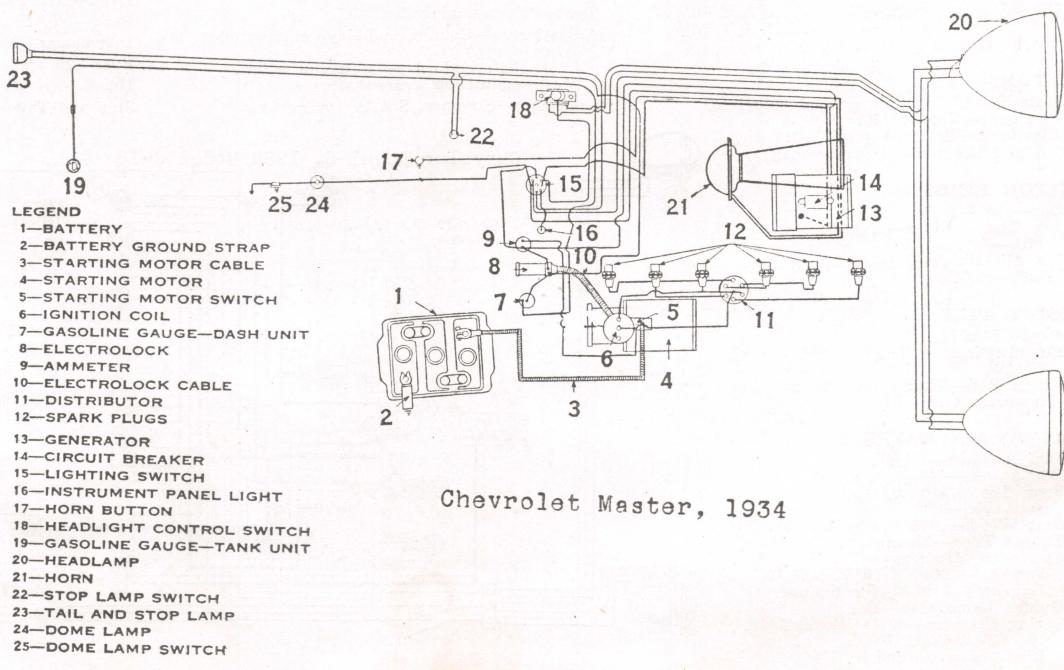
Distributor—Delco-Remy, No. 644-R.
Coil—Delco-Remy, No. 538-C.
Distributor Rotation—Clockwise.
Breaker Gap—.018".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.032".
Spark Plug Size—14 mm.
Manual Advance—None.
Automatic Advance—36°.
Vacuum Advance—17°.
Timing—Points open 10° B. T. C.; Neon
timing light, motor idling, steel ball in fly-
wheel at pointer on housing.
Coil Amps., Engine Idling, 1.9.
Stopped, 4.

BATTERY

Amps.—15-plate, 90 amperes.

LAMPS

Head—Mazda, No. 2320-C.
Park—Mazda, No. 63.
Instrument—Mazda, No. 63.
Fuse—15 amps.
Dome—Mazda, No. 81.
Stop and Tail—Mazda, No. 63.



Chrysler Royal 6, 1938

MODEL C-18

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—27.34.
Displacement—241.5 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—95 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—48 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—4, all but rear removable.
End Thrust Taken On—Thrust plate, front end. End play .002"- .006".
Bearing Clearance—Front, .001"- .003"; all others, .0015"- .0035".

CONNECTING RODS

End Clearance—.0055"- .0115".
Dia. Clearance—.0005"- .0025".

COOLING SYSTEM

Capacity—5 gals.
Pump Drive—Fan belt.
Belt Size—Not given.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Carter "BB" $1\frac{1}{2}$ ".
Type—Downdraft single.
Adjustment—Idle adjustment, $\frac{1}{2}$ to $1\frac{1}{4}$ turns open.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h.; 15 lbs. idling speed.
Adjustment—Change spring in relief valve.
Oil Average temp. 90°F.... S.A.E. 40.
 Average temp. 32°F.... S.A.E. 30.
 Average temp. 10°F.... S.A.E. 20W.
Oil Average temp. —10°F.... S.A.E. 10W.
 Average temp. —25°F.... S.A.E. 10W.
 plus 10% kerosene.

PISTONS

Material—U-slot, cam ground, anodized.
Clearance—Top—.022".
Clearance—Bottom—.0005"- .001", with 6 to 8 lbs. pull on spring scale.

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2, undercut.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2, slotted.
Width— $\frac{3}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 130° F.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{17}{32}$ ".
Dia. Intake— $1\frac{21}{32}$ ".
Stem Dia.—.340"- .341".
Seat Angle—45°.
Seat Width—.0635" ($\frac{1}{16}$ ").
Tappet Type—Mushroom.
Clearance—Hot:
Intake —.008" { .014" cold
Exhaust—.010" { for timing.
Guides Removable—Yes.
Spring Pressure—40-45 lbs. at $1\frac{3}{4}$ ".
101-109 lbs. at $1\frac{3}{8}$ ".
Limit of compression, $1\frac{3}{8}$ ".

CHASSIS

FRONT AXLE

Caster— $\frac{1}{2}^{\circ}$ to $2\frac{1}{2}^{\circ}$ (not adjustable).
Camber— $\frac{1}{4}^{\circ}$ to $+\frac{1}{2}^{\circ}$; $+\frac{1}{4}^{\circ}$ preferred.
Toe-in— $0\frac{1}{4}$ "; $\frac{1}{16}$ " preferred.
Kingpin Angle— $4\frac{3}{4}^{\circ}$ to 6° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"- .0025" draw (tension).
Lash—.006"- .010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear, 3-speed.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Needle roller.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Front shoe, $11\frac{15}{32}$ " x 2" x $1\frac{13}{64}$ ";
rear shoe, $7\frac{31}{32}$ " x 2" x $1\frac{13}{64}$ ".
Hand brake, $1\frac{7}{16}$ " x 2" x $\frac{5}{16}$ ".
Adjustments—Eccentric or cam for clearance.
Eccentric anchor for each shoe.
Clearance—Top—.012".
Bottom—.006".
Hand brake, .025".
Brake Effort—Not given.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Bushing.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—U—threaded.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Cross-shaft end play—adjusting screw.
Mesh—shims on cross-shaft.
Lubricant—Summer, S.A.E. 160 or 140.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Solenoid-operated gear.
Rotation—Clockwise.
No Load—65 amps., 5.5 volts, 5300 r.p.m.
Lock Torque—25 ft. lbs., 4.0 volts, 880 amps.
Brush Spring Tension—42-53 oz.

GENERATOR

Make—Auto-Lite.
Drive—Fan belt.
Regulation—Current and voltage regulator.
Thermostat—None.
Output, cold—28 amps., 8 volts, 1800 to 2300 r.p.m. and up—on test bench.
Output, hot—28 amps., 8 volts, 1900 to 2420 r.p.m. and up—on test bench.
Brush Spring Tension—53 oz. (new brushes).
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 volts at 9.3 m.p.h.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

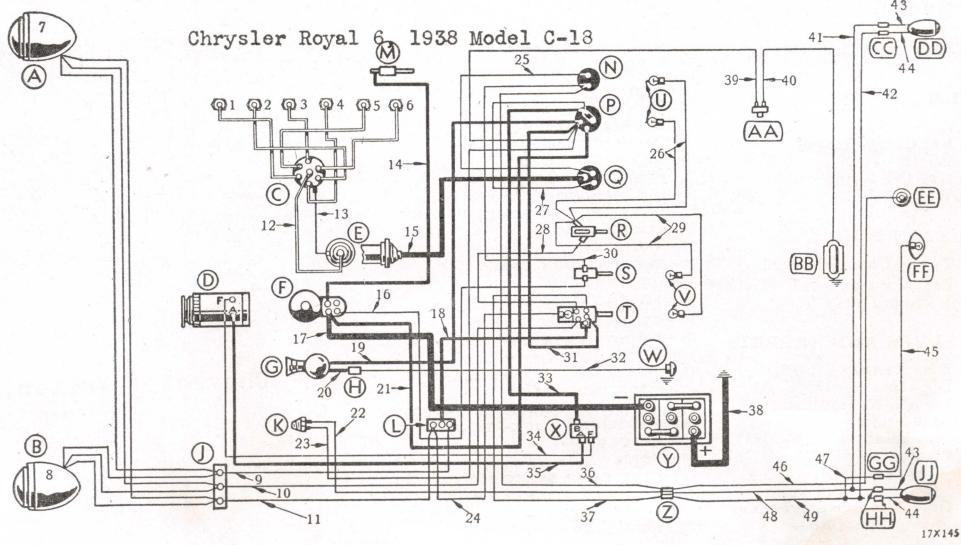
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Sp. Plug Size—Std. head, Champion "J-8";
alum. head, "H-10-14 m/m".
Manual Advance—None.
Automatic Advance— 24° .
Vacuum Advance— 16° .
Timing—Standard (iron) head, top dead center, alum. head, .004" piston travel or 3° past top center.
Coil Amps., Engine Idling—2.0 amps.
Coil Amps., Engine Stopped—5.0 amps.

BATTERY

Amps.—119 amps.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps., back of ammeter.
Dome—No. 87.
Stop and Tail—No. 1158.



17X145

Chrysler Custom Imperial, 1938

MODEL C-20

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{7}{8}$ ".
Taxable H. P.—33.80.
Displacement—323 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—130 at 3400 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—47 links, $1\frac{1}{2}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—Not given.
End Thrust Taken On—Thrust plate front end. End play, .001"-0.008".
Bearing Clearance—Front, .001"-0.0030". All others, .0015"-0.0035".

CONNECTING RODS

End Clearance—.006"-0.011".
Dia. Clearance—.001"-0.003".

COOLING SYSTEM

Capacity—5 gals.
Pump Drive—Fan belt.
Belt Size—Not given,
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No Bearings—5.
Material—Bronze-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"-0.007".
Dia. Clearance—.001"-0.002".

FUEL SYSTEM

Carburetor Make—Stromberg "AAV-2."
Type—Dual downdraft.
Adjustment—Turn clockwise for lean; counter-clockwise for richer mixture.
Adjustment—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h., 15 lbs. idling.
Adjustment—Change spring in relief valve.
Oil | Average temp. 90°F....S.A.E. 40.
Oil | Average temp. 32°F....S.A.E. 30.
Oil | Average temp. 10°F....S.A.E. 20W.
Oil | Average temp. —10°F....S.A.E. 10W.
Oil | Average temp. —25°F....S.A.E. 10W.
Oil | plus 10% kerosene.

PISTONS

Material—U-slot, cam-ground, anodized.
Clearance—Top—.022".
Clearance—Bottom—.0005"-0.001", with 5 to 6 pounds push on spring scale.

PISTON RINGS

Gap—.007"-0.015".
No. Comp. Rings—2, undercut.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2, slotted.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 130°F.
Fit in Rod—Thump push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{13}{32}$ ".
Dia. Intake— $1\frac{5}{32}$ ".
Stem Dia.—.340"—.341".
Seat Angle—45°.
Seat Width—.0635" ($\frac{1}{16}$ ").
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006" (valve timing .011").
Exhaust—.010" (valve timing .014")
Guides Removable—Yes.
Spring Pressure—46-50 lbs. at $21\frac{1}{2}$ °.
104-110 lbs. at $11\frac{1}{16}$ °.
Limit of compression $1\frac{1}{2}$ ".

CHASSIS

FRONT AXLE

Caster— $1^{\circ}30'$, not adjustable.
Camber— $\frac{1}{4}^{\circ}$; $+\frac{1}{2}^{\circ}$; $+\frac{3}{4}^{\circ}$ preferred.
Toe-in— $0''\text{--}\frac{1}{8}''$; $\frac{1}{16}''$ preferred.
Kingpin Angle— $4\frac{3}{4}^{\circ}\text{--}6^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"-0.0025" draw (tension).
Lash—.006"-0.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $6\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear, 3-speed.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Needle roller.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Per shoe, $14\frac{1}{2}\frac{3}{8}$ " x $2\frac{1}{2}$ " x $\frac{1}{4}$ ".
Hand brake, $21\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for clearance.
Eccentric anchor for each shoe.
Brake Effort—Not given.

CLUTCH

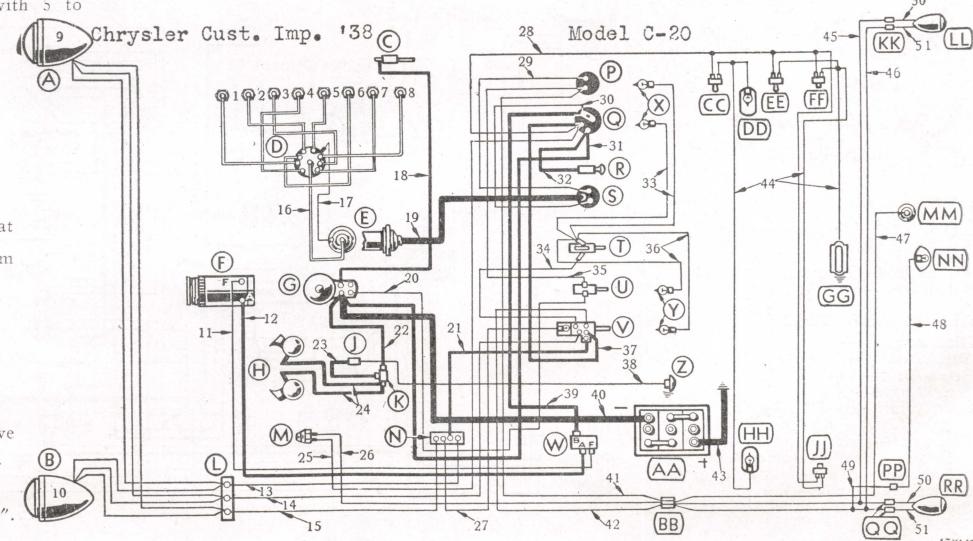
Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Bushing.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded U.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under cover.
Mesh—cross-shaft adjusting screw.
Lubricant—Winter, S.A.E. 90.
Summer, S.A.E. 160 or 140.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Solenoid operated gear.
Rotation—Clockwise, viewing drive end.
No Load—65 amps, 5.5 volts, 5300 r.p.m.
Lock Torque—25 ft. lbs., 4.0 volts, 880
amps.
Brush Spring Tension—Not given.

GENERATOR

Make—Auto-Lite.
Drive—Fan belt.
Regulation—Current and voltage regulator.
Thermostat—None.
Output, cold—28 amps, 8.0 volts, 1600 to
1800 r.p.m. and up on test bench.
Output, hot—28 amps, 8.0 volts, 1900 to
2200 r.p.m. and up on test bench.
Brush Spring Tension—23-27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to close—7.0 volts at 9.1 m.p.h.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.018".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—Std. head, Champion "J-8";
alum head, "H-10" 14 m/m.
Manual Advance—None.
Automatic Advance—24°.
Vacuum Advance—14°.
Timing—Alum. head, 6.5 to 1 comp. ratio,
top dead center.
Alum. head, 7.45 to 1 comp. ratio, .038"
or 9° past top dead center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

BATTERY

Amps.—136 amps.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps. back of ammeter.
Dome—No. 87.
Stop and Tail—No. 1158.

Chrysler Imperial, 1938

MODEL C-19

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—33.8.
Displacement—298.6 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max H. P.—110 at 3400 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—47 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—6.
End Thrust Taken On—Thrust plate, front end.
End play .001"-0.008".
Bearing Clearance—Front .001"-0.003"; all others .0015"-0.0035".

CONNECTING RODS

End Clearance—.006"-0.011".
Dia. Clearance—.001"-0.003".

COOLING SYSTEM

Capacity—5 gals.
Pump Drive—Fan belt.
Belt Size—Not given.
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Bronze-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"-0.007".
Dia. Clearance—.001"-0.002".

FUEL SYSTEM

Carburetor Make—Stromberg "AAV2."
Type—Dual downdraft.
Adjustment—Turn clockwise for lean; counter-clockwise for rich mixture.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h.; 15 lbs. idling.
Adjustment—Change spring in relief valve.

Average temp.	90°F....	S.A.E. 40.
Average temp.	32°F....	S.A.E. 30.
Average temp.	10°F....	S.A.E. 20.
Oil	Average temp. —10°F....	S.A.E. 10W.
	Average temp. 25°F....	S.A.E. 10W.
	plus 10% kerosene.	

PISTONS

Material—U-slot, cam-ground, anodized.
Clearance—Top—.022".
Clearance—Bottom—.0005"-0.001", with 5 to 6 lbs. pull on spring scale.

PISTON RINGS

Gap—.007"-0.015".
No. Comp. Rings—2, undercut.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2, slotted.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 130° F.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{13}{32}$ ".
Dia. Intake— $1\frac{5}{32}$ ".
Stem Dia.—.340"—.341".
Seat Angle—45°.
Seat Width—.0635" ($\frac{1}{16}$ ").
Tappet Type—Mushroom.
Clearance—Hot:
Intake—.006"—.011" cold for timing.
Exhaust—.010"—.014" cold for timing.
Guides Removable—Yes.
Spring Pressure—46-50 lbs. at $2\frac{1}{2}$ sec.
104-110 lbs. at $11\frac{1}{16}$ sec.
Limit of compression— $1\frac{1}{2}$ ".

CHASSIS

FRONT AXLE

Caster— $\frac{1}{2}$ ° to $2\frac{1}{2}$ ° (not adjustable).
Camber— $\frac{1}{2}$ ° to $+\frac{1}{2}$ °; $+\frac{1}{4}$ ° preferred.
Toe-in— $0\frac{1}{8}$ "; $\frac{1}{16}$ " preferred.
Kingpin Angle— $4\frac{3}{4}$ °-6°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"-0.0025" draw (tension).
Lash—.006"-0.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear, 3-speed.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Needle roller.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Per shoe, $12\frac{1}{16}$ " x 2" x $18\frac{1}{64}$ ".
Hand brake, $17\frac{1}{16}$ " x 2" x $5\frac{3}{32}$ ".
Adjustments—Eccentric for clearance.
Eccentric anchor for each shoe.
Clearance—Top—.012".
Bottom—.006".
Hand brake—.025".
Brake Effort—Not given.

CLUTCH

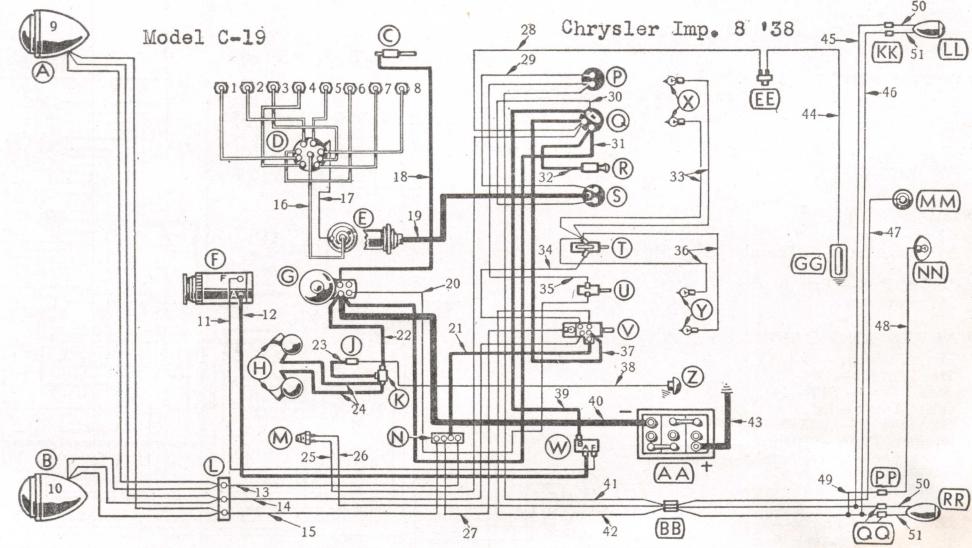
Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Bushing.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded U.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover. Mesh—cross-craft adjusting screw.
Lubricant—Summer, S.A.E. 160 or 140.
Winter, S.A.E. 90.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Solenoid operated gear.
Rotation—Clockwise, viewing drive end.
No Load—65 amps., 5.5 volts, 5300 r.p.m.
Lock Torque—25 ft. lbs., 4.0 volts, 880 amps.
Brush Spring Tension—Not given.

GENERATOR

Make—Auto-Lite.
Drive—Fan belt.
Regulation—Current and voltage regulator.
Thermostat—None.
Output, cold—28 amps., 8 volts., 1600-1800 r.p.m. and up—bench test.
Output, hot—28 amps., 8 volts, 1900-2200 r.p.m. and up—bench test.
Brush Spring Tension—23-27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 volts at 9.1 m.p.h.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.018".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Sp. Plug Size—Std. head, Champion "J-8"; alum. head, "H-10", 14 m/m.
Manual Advance—None.
Automatic Advance—24°.
Vacuum Advance—18°.
Timing—Std. (iron) head, .004", or 3° before top center.
Alum head, 6.5 to 1 comp. ratio, top dead center.
Alum head, 7.4 to 1 comp. ratio .004", or 3° after top center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

BATTERY

Amps.—120 amps.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps. back of ammeter.
Dome—No. 87.
Stop and Tail—No. 1158.

Chrysler Imperial 8, 1937

MODEL C-14

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{4}$ "
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—33.8.
Displacement—273.8 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—110 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—47 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other in line through shaft centers.
Bearings—6, steel-backed babbitt except rear.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0015"- .0035".

CONNECTING RODS

End Clearance—.006"- .011".
Dia. Clearance—.001"- .003".

COOLING SYSTEM

Capacity— $5\frac{1}{2}$ gals.
Pump Drive—Belt.
Belt Size— $40^{\prime\prime} \times 48\frac{3}{4}'' \times \frac{3}{4}''$.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Steel-backed babbitt.
End Thrust Taken On—Rear.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Downdraft dual.
Adjustment—Idle Adjustment only. Turn in for lean; out, for richer mixture.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—30 to 45 lbs. at 30 m.p.h.
Adjustment—Replace spring in relief valve.

70° - 110° F.....	S.A.E. No. 40
40° - 110° F.....	S.A.E. No. 30
32° - 80° F.....	S.A.E. No. 20 or 20W
10° - 80° F.....	S.A.E. No. 20W. only
-10° - 45° F.....	S.A.E. No. 10W. only
-30° - 20° F.....	S.A.E. No. 10W. plus 10% kerosene.

PISTONS

Material—Alum. alloy, anodic finish, U-slot.
Clearance—Top—.022".
Clearance—Bottom—.022", with 5 to 7 lbs. pull.

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2 (undercut).
Width— $\frac{1}{16}$ ".
No. Oil Rings—2 (slotted).
Width— $5\frac{1}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 130° F.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{13}{32}$ ".
Dia. Intake— $1\frac{5}{32}$ ".
Stem Dia.—.3405".
Seat Angle—45°.
Seat Width—.0635".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006".
Exhaust—.010".
Guides Removable—Yes.
Spring Pressure
46-50 lbs. valve closed ($2\frac{1}{32}$ ").
104-110 lbs. valve open ($1\frac{1}{16}$ ").

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ ° preferred.
Camber— $\frac{1}{4}$ °- $\frac{1}{2}$ ° ($\frac{1}{4}$ ° preferred).
Toe-in— $0''$ - $\frac{1}{8}''$ ($\frac{1}{16}$ ° preferred).
Kingpin Angle— $4\frac{3}{4}$ °- 6 °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, Hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Draw tension .0015"- .0025".
Lash—.006"- .010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear.
Main Shaft Bearing Type and No.—MRC 207 MFG and 207 SF.
—Countershaft Bearing Type and No.—Needle bearings.

BRAKES

Type—Hydraulic.
Lining Type—Moulded.
Lining Size— $22\frac{3}{8}'' \times 2'' \times 1\frac{3}{16}''$.
Hand brake $16\frac{15}{16}'' \times 2'' \times \frac{5}{32}''$.

ADJUSTMENTS

Cam adjustment for lining wear.
Eccentric anchor adjustment.
Clearance—Top—.012".
Bottom—.006".
Hand brake, .025".
Brake Effort—Not given.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Oilite bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent-U.

STEERING GEAR

Type—Worm and roller.
Adjustments
Column end play—shims under lower cover.
Cross-shaft—adjusting screw.
Mesh—shims under side cover.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Positive shift, foot operated.
Rotation—Clockwise, facing drive end.
No Load—65 amps., 5.5 volts, 5300 r.p.m.
Lock Torque—25 ft. lbs., 880 amps., 4 volts.
Brush Spring Tension—Not given.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Vibrating type current and voltage regulators.
Thermostat—None.
Output, cold—28 amps., 8 volts, 1420 r.p.m.
Output, hot—28 amps., 8 volts, 1700 r.p.m.
Brush Spring Tension—18-20 oz.
Rotation—Clockwise, facing drive end.
Cutout to Close—7 volts at 9 m.p.h.
Amps. Discharge to Open—2.0.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise, viewed from above.
Breaker Gap—.018".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Sp. Plug Size—14 m/m, Champion "H-10."
Manual Advance—None.
Automatic Advance— 20° .
Vacuum Advance— 14° .
Timing—3 degrees or .004" piston travel past top center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

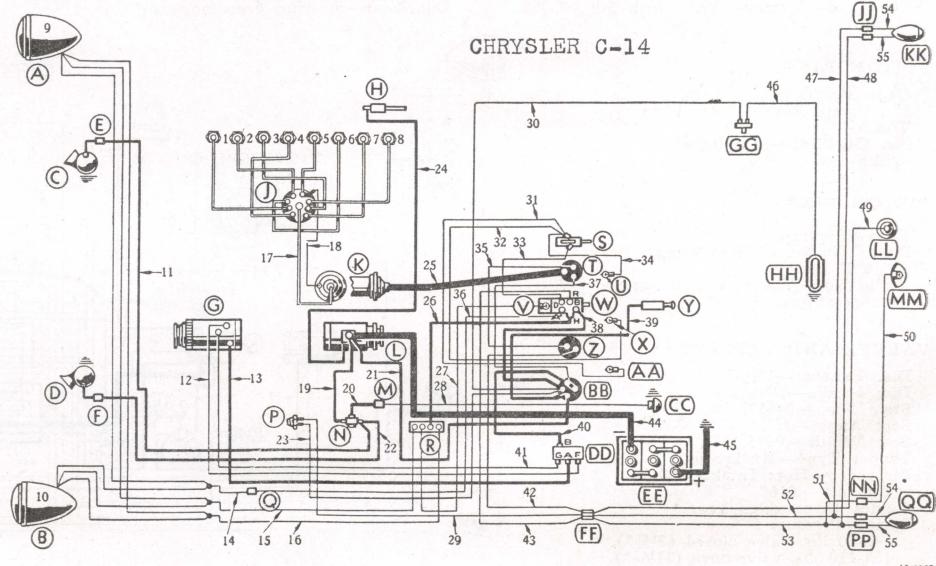
BATTERY

Amps.—119 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.

CHRYSLER C-14



Chrysler Custom Imperial 8, 1937

MODEL C-15

ENGINE

DATA

No. Cylinders—8.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—33.8.
Displacement—323.5 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—130 at 3400 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—47 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—6, steel-backed babbitt, except rear.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0015"- .0035".

CONNECTING RODS

End Clearance—.006"- .011".
Dia. Clearance—.001"- .003".

COOLING SYSTEM

Capacity— $5\frac{1}{4}$ gals.
Pump Drive—Belt.
Belt Size— $40^{\circ}V$ — $48\frac{3}{4}$ " x $\frac{3}{4}$ ".
Belt Adjustment—Generator adjustment.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Steel-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Dual downdraft.
Adjustment—Idle adjustment only—Turn in for lean; out, for richer mixture.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—34-45 lbs. at 30 m.p.h.
Adjustment—Replace spring in relief valve.
Oil $\begin{cases} 70^{\circ}-110^{\circ} F. & \dots S.A.E. No. 40 \\ 40^{\circ}-110^{\circ} F. & \dots S.A.E. No. 30 \\ 32^{\circ}-80^{\circ} F. & \dots S.A.E. No. 20 or 20W \\ 10^{\circ}-80^{\circ} F. & \dots S.A.E. No. 20W. only \\ -10^{\circ}-45^{\circ} F. & \dots S.A.E. No. 10W. only \\ -30^{\circ}-20^{\circ} F. & \dots S.A.E. No. 10W. plus 10% kerosene. \end{cases}$

PISTONS

Material—Alum. alloy, anodic finish, U-slot.
Clearance—Top—.022".
Clearance—Bottom—.002", with 5 to 7 lbs. pull.

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2 (undercut).
Width— $\frac{1}{16}$ ".
No. Oil Rings—2 (slotted).
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at $130^{\circ}F$.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{19}{32}$ ".
Dia. Intake— $1\frac{15}{32}$ ".
Stem Dia.—.3405".
Seat Angle—45°.
Seat Width—.0635.
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006".
Exhaust—.010".
Guides Removable—Yes.
Spring Pressure
46-50 lbs. valve closed ($2\frac{1}{2}$ ").
104-110 lbs. valve open ($1\frac{11}{16}$ ").

CHASSIS

FRONT AXLE

Caster— 2° no load.
Camber— $-1\frac{1}{4}^{\circ}$ + $\frac{1}{2}^{\circ}$ (+ $\frac{1}{4}^{\circ}$ preferred).
Toe-in—0"— $\frac{1}{8}$ " ($\frac{1}{16}$ " preferred).
Kingpin Angle— $4\frac{3}{4}^{\circ}$ — 6° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Draw tension, .0015"—.0025".
Lash—.006"—.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $6\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear.
Main Shaft Bearing Type and No.—MRC 208 MFG and 208S.
Countershaft Bearing Type and No.—Needle bearings.

BRAKES

Type—Hydraulic.
Lining Type—Moulded.
Lining Size— $24\frac{7}{8}$ " x 2" x $\frac{1}{4}$ ".
Hand brake $21\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{3}{16}$ ".
Adjustments
Cam adjustment for lining wear.
Eccentric anchor adjustment.
Clearance—Top—.012".
Bottom—.006".
Hand brake .025".
Brake Effort—Not given.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Oilite bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent-U and rubber.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Cross-shaft—adjusting screw.
Mesh—shims on cross-shaft.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Solenoid positive shift.
Rotation—Clockwise, facing drive end.
No Load—65 amps., 5.5 volts, 5300 r.p.m.
Lock Torque—25 ft. lbs., 880 amps., 4 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Vibrating type current and voltage regulator.
Thermostat—None.
Output, cold—28 amps., 8.0 volts, 1420 r.p.m.
Output, hot—28 amps., 8.0 volts, 1700 r.p.m.
Brush Spring Tension—18-20 oz.
Rotation—Clockwise, facing drive end.
Cutout to Close—7 volts at 9 m.p.h.
Amps. Discharge to Open—2.0.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise, viewed from above.
Breaker Gap—.018".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spk. Plug Size—14 m/m. Champion "H-10."
Manual Advance—None.
Automatic Adv.— 22° .
Vacuum Adv.— 14° .
Timing—5 degrees or .012" piston travel past top dead center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

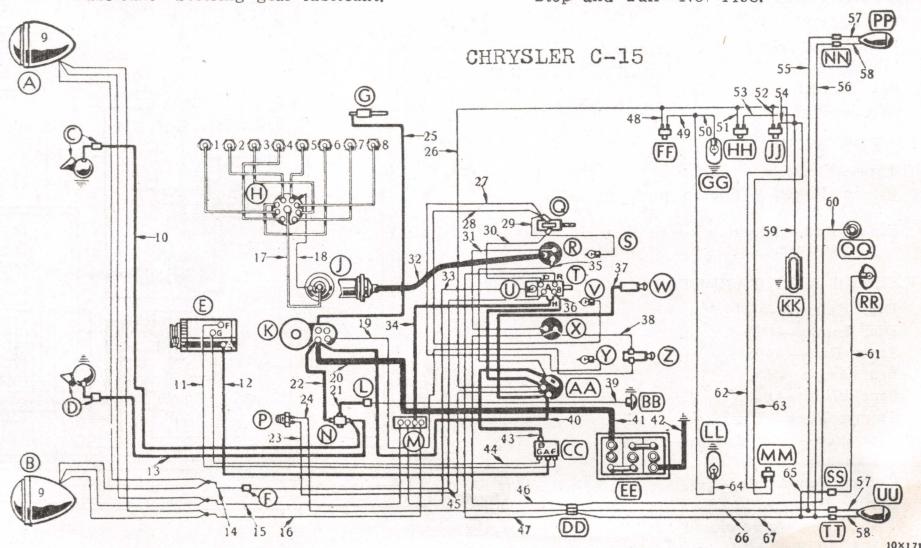
BATTERY

Amps.—136 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.

CHRYSLER C-15



Cord 8, 1937

MODEL 812

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{2}$ ".
Stroke— $3\frac{3}{4}$ ".
Taxable H. P.—39.2.
Displacement—288.64 cu. in.
Firing Order—1L-3L-4L-2L-2R-1R-3R-4R.
Max. H. P.—115 at 3800 r. p. m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—58 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—15 links, between marks in sprockets.
Bearings—5, steel backed babbitt.
End Thrust Taken On—Thrust plate front end.
Bearing Clearance—Not specified.

CONNECTING RODS

End Clearance—.006"—.012".
Dia. Clearance—.001"—.0025".

COOLING SYSTEM

Capacity—28 qts.
Pump Drive—Belt.
Belt Size—V type, $3\frac{3}{4}$ " x $\frac{3}{4}$ ".
Belt Adjustment—In fan pulley.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze babbitt.
End Thrust Taken On—Center.
End Clearance—.005"—.010".
Dia. Clearance—.002"—.0035".

FUEL SYSTEM

Carburetor Make—Stromberg EE 15.
Type—Down draft dual.
Adjustment—Turning idle adjustment out, enriches mixture; in, leans mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—40 lbs. maximum with hot oil.
Adjustment—Non-adjustable.
Winter Oil—No. 30 S. A. E.
Summer Oil—No. 20 W S. A. E.

PISTONS

Material—Ray-Day alum. alloy.
Clearance—Top—.026".
Bottom—.002".

PISTON RINGS

Gap—.009"—.014".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0002".
Fit in Rod—.0002".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{3}{8}\frac{1}{64}$ ".
Dia. Intake— $1\frac{23}{32}\frac{1}{32}$ ".
Stem Dia.—.3425."
Seat Angle—Intake 30°, exhaust 45°.
Tappet Type—Rocker lever.
Clearance—Hot: Intake—.008"—.010", .016" at valve for timing.
Exhaust—.008"—.010"; .016" at valve for timing.
Guides Removable—Yes.
Spring Pressure—
57-62 lbs. at $2\frac{1}{16}$ ".
118-126 lbs. at $1\frac{27}{32}$ ".

CHASSIS

FRONT AXLE

Caster— 1° — $2\frac{1}{2}^{\circ}$, positive.
Camber— 1° .
Toe-out—0"— $\frac{1}{8}$ " (never in).
Kingpin Angle— 6° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Dial type. Front drive, spiral bevel.
Adjustment—Shims.
End Play—None.
Lash—.003"—.005".
Diff. Bearing Type—Timken.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—Transmission and differential, 5 qts.

TRANSMISSION

Make and Type—Own, helical gear.
Main Shaft Bearing Type and No.—Ball bearing, MRC 530SG, MRC 2078F.
Countershaft Bearing Type and No.—Ball bearing, ND 1308.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded on forward, woven on reverse shoe.
Lining Size—12" moulded, 12" woven x $2\frac{1}{4}$ " x $\frac{3}{16}$ ".
Adjustments—
Eccentric for centralizing.
Adjusting screw for clearance.
Adjustable anchor.
Clearance, Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Long single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—N. D. 7109.
Throwout Bearing Type and No.—Bantam No. A 584.

SPRINGS

Type Front—Transverse, semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Rubber.

STEERING GEAR

Type—Gemmer worm and roller.
Adjustments
Column end play—shims at bottom.
Cross-shaft end play—adjusting screw.
Mesh—shims on cross-shaft.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite, MAX 4021.
Drive—Bendix.
Rotation—Counter-clockwise, viewing drive end.
No Load—65 amps., 5.5 volts, 5300 r. p. m.
Lock Torque—25 ft. lbs., 880 amps., 4 volts.
Brush Spring Tension—31-42 oz.

GENERATOR

Make—Auto-Lite, GBR 4603.
Drive—Belt.
Regulation—Two-charge current regulator.
Thermostat—None.
Output, cold—23 amps., 8.75 volts, 2300 r. p. m.
Output, hot—20 amps., 8.75 volts, 2500 r. p. m.
Brush Spring Tension—Worn, 24 oz. min., new 36 oz. max.
Rotation—Counter-clockwise, viewing drive end.
Cutout to close—6.5 to 7.2 volts at 9.7 m. p. h.
Amps. Discharge to Open—.5 - 2.5.
Field Fuse—5 amps.

IGNITION

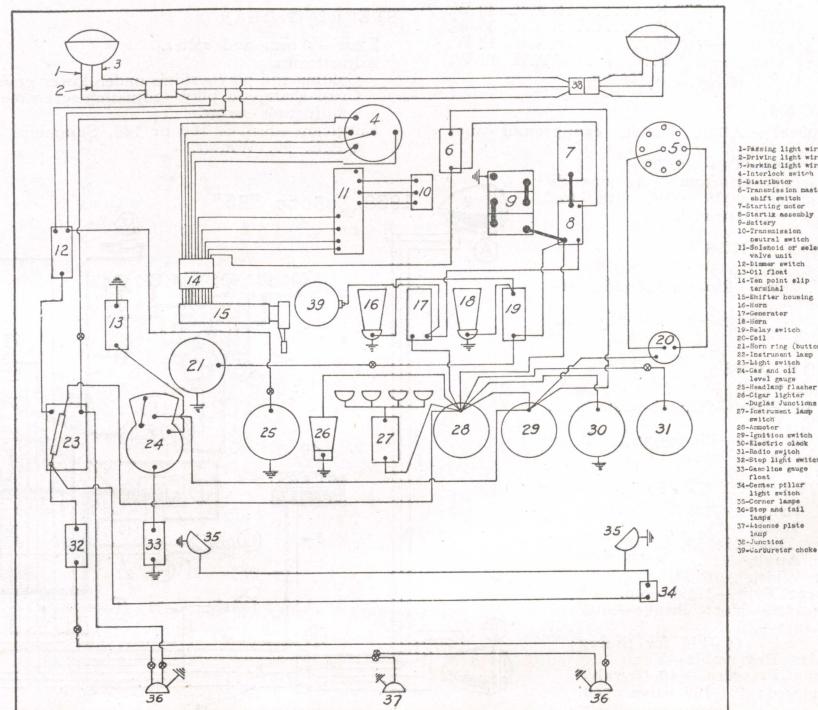
Distributor—Auto-Lite, IGP 4006.
Coil—Auto-Lite, CE 4620.
Distr. Rotation—Clockwise.
Breaker Gap—.013"—.017".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—Champion "J9B," 14 m/m.
Manual Advance—None.
Automatic Adv.— 20° .
Timing— 3° before top dead center.
Coil Amps., Engine Idling—3.5-4.
Coil Amps., Engine Stopped—5.

BATTERY

Amps.—10.8 amp. hrs.

LAMPS

Head—No. 2331.
Park—No. 63.
Instrument—No. 63.
Fuse—20 amps.
Dome—No. 81.
Stop and Tail—No. 63.



De Soto, 1938

MODEL S-5

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—27.34.
Displacement—228.1 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—Std. head, 93 at 3600 r.p.m.
Spec. head, 100 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—4, steel-backed babbitt except rear in case.
End Thrust Taken On—Thrust plate.
End play, .002"--.006".
Bearing Clearance—No. 1, .001"--.003"; all others .0015"--.0035".

CONNECTING RODS

End Clearance—.0055"--.0115".
Dia. Clearance—.0005"--.0025".

COOLING SYSTEM

Capacity—5 gals.
Pump Drive—Belt.
Belt Size— $40^{\circ}V$ — $43\frac{3}{4}$ " x $3\frac{1}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed babbitt, precision, removable.
End Thrust Taken On—Rear bearing.
End Clearance—.003"--.007".
Dia. Clearance—.001"--.002".

FUEL SYSTEM

Carburetor Make—Carter B. & B.
Type—Down-draft single.
Adjustment—Idle— $\frac{1}{2}$ to $1\frac{1}{4}$ turns open;
 $5\frac{1}{4}$ " float level.
Fuel Delivery—Mechanical pump, inverted type. Pressure 4 lbs.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h.; 15 lbs. idling speed.
Adjustment—Relief valve spring replacement.

Average 90° F.....	S.A.E. No. 40
Min. + 32° F.....	S.A.E. 30 W.
Min. + 10° F.....	S.A.E. 20 W.
Min. - 10° F.....	S.A.E. 10 W.
Min. - 25° F.....	S.A.E. 10 W.
plus 10% kerosene.	

PISTONS

Material—Alloy, U-slot, cam-ground anodized finish.
Clearance—Top, .022".
Clearance—Bottom—At max diameter—.0005"--.001", with 6 to 8 lbs. pull on scale.

PISTON RINGS

Gap—.007"--.015".
No. Comp. Rings—2 (undercut).
Width— $\frac{1}{8}$ ".
No. Oil Rings—2 (slotted).
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb-push fit at 130° F.
Fit in Rod—Thumb-push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{3}{16}$ ".
Dia. Intake— $1\frac{1}{2}$ ".
Stem Dia.—.3405".
Seat Angle—45°.
Seat Width—.0635".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.008".
Exhaust—.010".
(.014" for timing)

Guides Removable—Yes.

Spring Pressure—40-45 valve closed; 101-109 valve open.

CHASSIS

FRONT AXLE

Caster— $\frac{1}{2}^{\circ}$ - $2\frac{1}{2}^{\circ}$, not adjustable, no load.
Camber— $-\frac{1}{4}^{\circ}$ to $+\frac{1}{2}^{\circ}$ ($+\frac{1}{4}^{\circ}$ preferred), no load.
Toe-in— $0^{\circ}\frac{1}{2}^{\circ}$ ($\frac{1}{16}^{\circ}$ preferred), no load.
Kingpin Angle— $43^{\circ}\frac{1}{2}^{\circ}$, no load.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"--.0025" tight.
Lash—.006"--.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Slight drag.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Own, synchro-mesh.
Main Shaft Bearing Type and No.—Not given.
Countershaft Bearing Type and No.—Needle.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Front shoe— $11\frac{1}{2}^{\circ}22^{\prime \prime} \times 2^{\prime \prime} \times 1\frac{3}{4}^{\prime \prime}$.
Rear shoe— $7\frac{1}{2}^{\circ}22^{\prime \prime} \times 2^{\prime \prime} \times 1\frac{3}{4}^{\prime \prime}$.
Hand brake— $17\frac{1}{2}^{\circ}22^{\prime \prime} \times 2^{\prime \prime} \times 1\frac{3}{4}^{\prime \prime}$.
Adjustments—Eccentric for clearance.
Eccentric anchor.
Clearance—Top, .012".
Bottom, .006".
Brake Effort—55% front; 45% rear.

CLUTCH

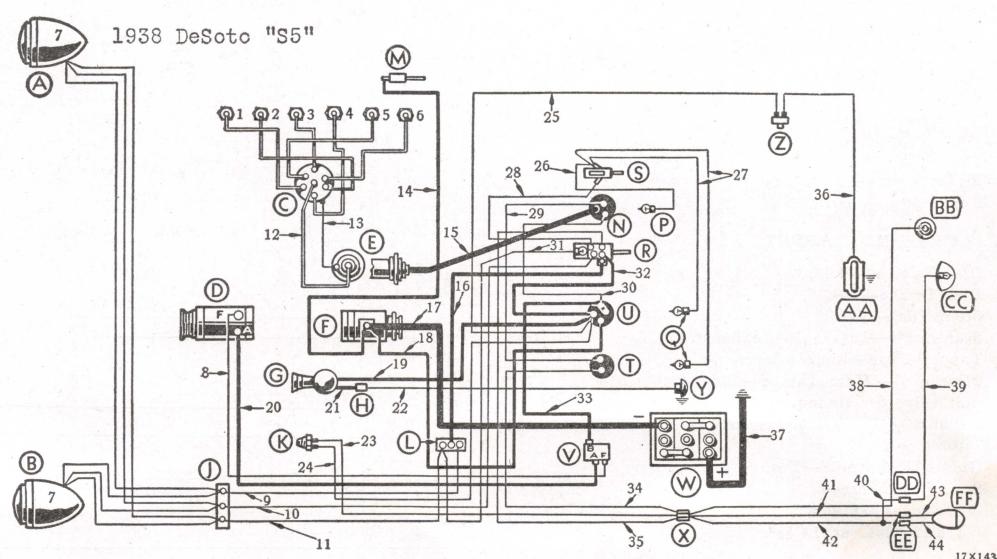
Type—Single plate, dry, ventilated.
Facing Type—Asbestos woven and compressed.
Pilot Bearing Type and No.—Oilite, bronze bushing.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—"U", threaded.

STEERING GEAR

Type—Worm and roller.
Adjustments
Column end-play—shims under lower cover.
Cross-shaft end play—adjusting screw mesh
—adjusting screw.
Lubricant—S.A.E. 160 or 140, Summer,
S.A.E. 90, Winter.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAW 4010.
Drive—Positive shift, foot operated.
Rotation—Counter-clockwise, viewed from front of car.
No Load—65 amps., 5.5 volts, 4900 r.p.m.
Lock Torque—18 ft. lbs., 670 amps., 4.0 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Auto-Lite—GDA—4801-A.
Drive—Belt.
Regulation—Vibrator type current and voltage regulator.
Thermostat—None.
Output, cold—28 amps., 8 volts, 2000 r.p.m.
Output, hot—28 amps., 8 volts, 2500 r.p.m., 22 m.p.h.
Brush Spring Tension—53 oz. max. new brushes.
Rotation—Clockwise, viewed from front of car.
Cutout to Close—7.0 volts at 850 r.p.m., 9.3 m.p.h.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite—IGS—4010-C1.
Coil—Auto-Lite.
Distr. Rotation—Clockwise, viewed from above.
Breaker Gap—.020".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—14 m/m Auto-Lite "H-10" for alum. head; "A-7" for iron head.
Manual Advance—None.
Automatic Advance—24° engine.
Vacuum adv., 14° engine.
Timing—Cast-iron head—Top dead center.
Aluminum head—3° after top center.
Coil Amps., Engine Idling—2.0 amps.
Coil Amps., Engine Stopped—5.0 amps.

BATTERY

Amps.—Wilard, 105 amp. hour.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.

DeSoto, 1937

MODEL S-3

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—27.34.
Displacement—228.1 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—93 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—48 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—4, steel-backed babbitt, except front.
End Thrust Taken On—Thrust plate, front end.
Bearing Clearance—.0015"- .0035".

CONNECTING RODS

End Clearance—.0055"- .0115".
Dia. Clearance—.0005"- .0025".

COOLING SYSTEM

Capacity—5 gallons.
Pump Drive—Belt.
Belt Size— 40° V- $43\frac{3}{4}'' \times \frac{3}{4}''$.
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Carter B. & B.
Type—Down draft single.
Adjustment—Idle— $\frac{1}{2}$ to $\frac{1}{4}$ turn open;
High speed—fixed jet.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30 to 45 lbs. at 30 m.p.h.
Adjustment—Replace spring in relief valve.
Oil { 70° - 110° F—S. A. E. No. 40.
 40° - 110° F—S. A. E. No. 30.
 32° - 80° F—S. A. E. No. 20 or 20-W.
 10° - 80° F—S. A. E. No. 20-W only.
 -10° - 45° F—S. A. E. No. 10-W only.
 -30° - 20° F—S. A. E. No. 10-W, plus 10% Kerosene.

PISTONS

Material—Alum Alloy, anodic surface, U-slot.
Clearance—Top—.022".
Clearance—Bottom—.002" with 5 to 7 lbs. pull.

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2 (undercut).
Width— $\frac{1}{16}$ ".
No. Oil Rings—2 (slotted).
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 130° F.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{17}{32}$ ".
Dia. Intake— $1\frac{1}{32}$ ".
Stem Dia.—.3405.
Seat Angle— 45° .
Seat Width—.0635.
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006".
Exhaust—.010".
.014" for valve timing.
Guides Removable—Yes.
Spring Pressure—40-45 lbs. valve closed.
101-109 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}^{\circ}$ preferred with no load.
Camber— $-\frac{1}{4}^{\circ}$ — $+\frac{1}{2}^{\circ}$ (plus $\frac{1}{4}^{\circ}$ preferred).
Toe-in— $0''$ — $\frac{1}{8}''$ ($\frac{1}{16}$ preferred).
Kingpin Angle— $4\frac{3}{4}^{\circ}$ — 6° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Draw tension .0015"—.0025".
Lash—.006"—.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear.
Main Shaft Bearing Type and No.—MRC
207 MFG and 207SF.
Countershaft Bearing Type and No.—
Needle bearings.

BRAKES

Type—Hydraulic.
Lining Type—Molded, Front $19\frac{13}{16}'' \times 2'' \times \frac{13}{64}$ ".
Lining Size—Molded, Rear $17\frac{1}{16}'' \times 2'' \times \frac{13}{64}$ ".
Adjustments—Cam for lining wear;
Eccentric anchor adjustment.
Clearance—Top—.012".
Bottom—.006".
Brake Effort—55% front; 45% rear.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Oilite bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent-U.

STEERING GEAR

Type—Worm and Roller.
Adjustments—Column end play—shims under lower cover. Cross shaft—set screw.
Mesh—shims under side cover.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto Lite.
Drive—Positive shift, foot operated.
Rotation—Front of car—counter clockwise
No Load—65 amps., 5.5 volts, 4900 r.p.m.
Lock Torque—18 ft lbs., 670 amps., 4 volts
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Auto-Lite.
Drive—V-Belt.
Regulation—Vibrating type current and voltage regulators.
Thermostat—None.
Output, cold—22 amps., 8 volts, 1500 r.p.m.
Output, hot—22 amps., 8 volts, 1900 r.p.m.
Brush Spr. Tension—18 oz.
Rotation—Front of car—clockwise.
Cutout to close—7 volts, 8 m.p.h.
Amps. Discharge to Open—2.0.
Field Fuse—None.

IGNITION

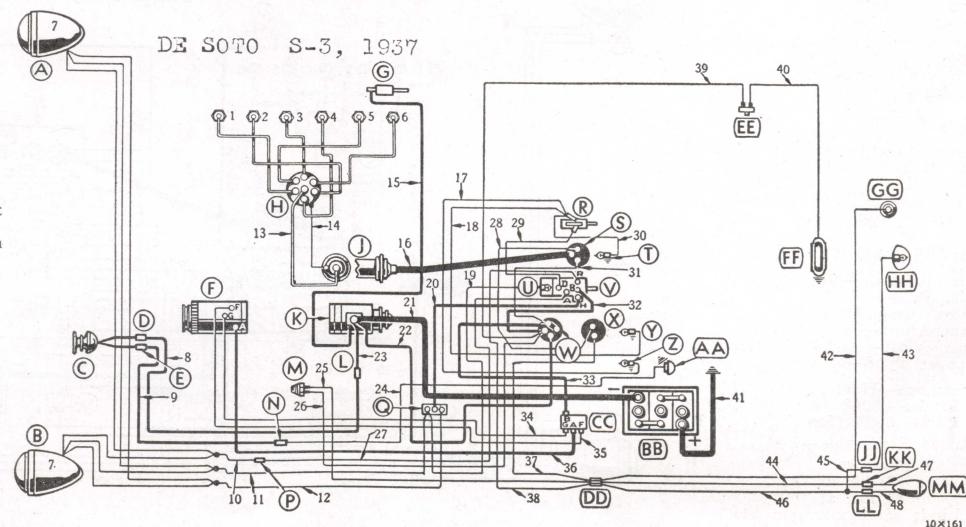
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise viewed from above.
Breaker Gap—.020".
Brush Spr. Tension—18-20 oz.
Sp. Plug Gap—.025".
Sp. Plug Size—14 m/m Champion.
Manual Advance—None.
Automatic Adv.— 24° .
Vacuum Adv.— 22° .
Timing—2 degrees or .002" piston travel past top center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

BATTERY

Amps—105 Amp hour.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.



Dodge D-8, 1938

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—25.35.
Displacement—217.8 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—87 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—48 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—Not given.
End Thrust Taken On—Thrust plate, front end.
End play,.002"-.006".
Bearing Clearance—Front, .001"-.003"; all others .0015"-.0035".

CONNECTING RODS

End Clearance—.0055"-.0115".
Dia. Clearance—.0005"-.0025".

COOLING SYSTEM

Capacity—15 qts.
Pump Drive—Fan belt.
Belt Size—Not given.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Bronze-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"-.007".
Dia. Clearance—.001"-.002".

FUEL SYSTEM

Carburetor Make—Stromberg "EXV-2," $1\frac{1}{4}$ ".
Type—Down-draft single.
Adjustment—Turn Idle screw clockwise for lean, and counter-clockwise for richer mixture.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h., 15 lbs. idling.
Adjustment—Change spring in relief valve.
Oil { Average temp., 90° F....S.A.E. 40
Average temp., 32° F....S.A.E. 30
Average temp., 10° F....S.A.E. 20W.
Oil { Average temp., -10° F....S.A.E. 10W.
Average temp., -25° F....S.A.E. 10W.
plus 10% kerosene.

PISTONS

Material—Split skirt, steel strut.
Clearance—Top—.022".
Clearance—Bottom—.0015"-.002" with 7 to 14 lbs. pull on spring scale.

PISTON RINGS

Gap—.007"-.015".
No. Comp. Rings—2, undercut.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2, slotted.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 160° F.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{64}$."
Dia. Intake— $1\frac{15}{64}$."
Stem Dia.—.340"—.341".
Seat Angle—45°.
Seat Width—.0635" ($\frac{1}{16}$ ").
Tappet Type—Mushroom.
Clearance—Hot:
Intake—.006" (for timing .011").
Exh.—.008" (for timing .012").
Guides Removable—Yes.
Spring Pressure
34 to 38 lbs. at $1\frac{3}{4}$."
77 to 83 lbs. at $1\frac{7}{16}$."
Limit of compression $1\frac{3}{8}$ ".

CHASSIS

FRONT AXLE

Caster— $1^{\circ}-3^{\circ}$, 2° preferred.
Camber— $\frac{1}{4}^{\circ}$ - $\frac{3}{4}^{\circ}$, $\frac{1}{2}^{\circ}$ preferred.
Toe-in— $0^{\circ}-\frac{1}{8}^{\circ}$, $\frac{1}{16}^{\circ}$ preferred.
Kingpin Angle— $4\frac{1}{2}^{\circ}-5\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"-.0025" draw (tension).
Lash—.006"-.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—3-speed, synchro-mesh.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Needle rollers.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Front shoe, $11\frac{15}{32}$ " x 2" x $1\frac{13}{64}$ ";
rear shoe, $7\frac{1}{2}$ " x 2" x $1\frac{13}{64}$ ".
Hand brake, $1\frac{1}{16}$ " x 2" x $\frac{5}{8}$ ".
Adjustments—Eccentric for shoe clearance.
Eccentric anchor for each shoe.
Clearance—Top—.012".
Bottom—.006".
Brake Effort—Not given.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Bushing.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded U.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Cross-shaft end play—adjusting screw.
Mesh—shims on cross-shaft.
Lubricant—Summer, S.A.E. 160 or 140.
Winter, S.A.E. 90.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Manually operated solenoid.
Rotation—Not given.
No Load—65 amps., 5.5 volts, 4900 r.p.m.
Lock Torque—18 ft. lbs., 4.0 volts, 670 amps.
Brush Spg. Tension—42-53 oz., new brushes.

GENERATOR

Make—Auto-Lite.
Drive—Fan belt.
Regulation—Current and voltage regulation.
Thermostat—None.
Output, cold—28 amps., 8 volts, 1800 to 2300 r.p.m. and up on test bench.
Output, hot—28 amps., 8.0 volts, 1900 to 2420 r.p.m. and up on test bench.
Brush Spring Tension—53 oz., new brushes.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 volts, 9.3 m.p.h.
Amps. Discharge to Open—2.0.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spring Tension—18 to 20 oz.
Spark Plug Gap—.025".
Spark Plug Size—Champion "J-8," 14 m/m.
Manual Advance—None.
Automatic Advance—24°.
Vacuum Advance—18°.
Timing—.007" or 40° after top dead center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

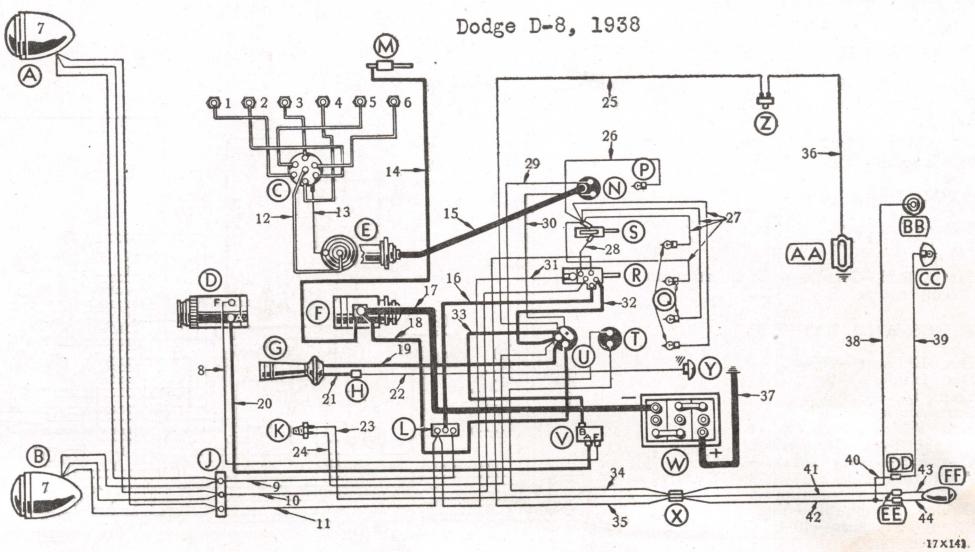
BATTERY

Amps.—95 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—Not given.
Dome—No. 87.
Stop and Tail—No. 1158.

Dodge D-8, 1938



Dodge, 1937

MODEL D-5

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—25.35.
Displacement—217.8 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—87 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks in line and opposite each other in line between shaft centers.
Bearings—4, replaceable except rear.
End Thrust Taken On—Thrust plate front end; end play .002"-0.006".
Bearing Clearance—.0015"-0.0035".

CONNECTING RODS

End Clearance—.0055"-0.0115".
Dia. Clearance—.0005"-0.0025".

COOLING SYSTEM

Capacity—4 gallons.
Pump Drive—Belt.
Belt Size—V-type; proportions not given.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"-0.007".
Dia. Clearance—.001"-0.002".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Downdraft single.
Adjustment—Turn clockwise for a leaner mixture and counter-clockwise for richer mixture.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30 lbs.-45 lbs. at 30 m.p.h.
Adjustment—By spring replacement in relief valve.
Oil—
Summer—70°-110° S.A.E. No. 40; 40°-110° S.A.E. No. 30.
Winter—32°-80° S.A.E. No. 20 or No. 20W; 10°-80° S.A.E. No. 20 only; —10°-45° S.A.E. No. 10W only; —30°-20° S.A.E. No. 10 W+10% kerosene.

PISTONS

Material—Alum. alloy—steel strut, split skirt.
Clearance—Top—.022".
Clearance—Bottom—.0015"-0.002", with 7 to 14 lbs. pull on scales.

PISTON RINGS

Gap—.007"-0.015".
No. Comp. Rings—2 (undercut compression).
Width— $\frac{1}{16}$ ".
No. Oil Rings—2 (slotted).
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Tight thumb push fit at 160° F.
Fit in Rod—Tight thumb push fit at normal room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{15}{32}$ ".
Stem Dia.—.3405".
Seat Angle—45°.
Seat Width—.0635".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006" (.011" valve timing).
Exhaust—.008" (.012 valve timing).
Guides Removable—Yes.
Spring Pressure—34-38 lbs. valve closed; 77-83 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $1^{\circ}-3^{\circ}$ (2° preferred).
Camber— $\frac{1}{4}^{\circ}$ - $\frac{3}{4}^{\circ}$ ($\frac{1}{2}^{\circ}$ preferred).
Toe-in— $0^{\prime\prime}$ - $\frac{1}{16}^{\prime\prime}$ ($\frac{1}{16}^{\prime\prime}$ preferred).
Kingpin Angle— $4\frac{1}{2}^{\circ}$ - $5\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"-0.0025" draw or tension.
Lash—.006"-0.010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear.
Main Shaft Bearing Type and No.—MRC 207 SFG and MRC 207 SF.
Countershaft Bearing Type and No.—Needle bearing.

BRAKES

Type—Hydraulic.
Lining Type—Not specified.
Lining Size—
Lining Size—Front, $19\frac{13}{16}$ " x 2" x $1\frac{3}{64}$ ".
Rear, $17\frac{19}{32}$ " x 2" x $1\frac{3}{64}$ ".
Hand Brake, $16\frac{15}{16}$ " x 2" x $1\frac{5}{32}$ ".
Adjustments
Cam adjustment for lining wear.
Eccentric anchor adjustment.
Clearance—Top—.012".
Bottom—.006".
Hand Brake—.025".
Brake Effort—Not given.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Oilite bronze.
Throwout Bearing Type and No.—Ball bearing.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—U-Thread.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Cross-shaft end play-adjusting screw.
Mesh—shims under side cover.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Positive shift, foot operated.
Rotation—Clockwise from drive end.
No Load—65 amps., 5.5 volts, 4900 r.p.m.
Lock Torque— $11\frac{1}{2}$ ft. lbs., 505 amps., 3.0 volts.
Brush Spring Tension—42-53 oz.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Voltage and current regulation.
Thermostat—None.
Output, cold—22 amperes max.
Output, hot—Max. 22 amps., 8 volts, at 1480 r.p.m.
Brush Spring Tension—24-36 oz.
Rotation—Clockwise from drive end.
Cutout to Close—6.5 to 7.0 volts.
Amps. Discharge to Open—2-3.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise viewed from above.
Breaker Gap—.020".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—14 m/m, Champion "J-8".
Manual Advance—None.
Automatic Advance— 24° at 3500 r.p.m. max.
Vacuum Advance— 18° at 12" mercury, max.
Timing—4 degrees after top dead center, or .007" piston travel past top dead center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

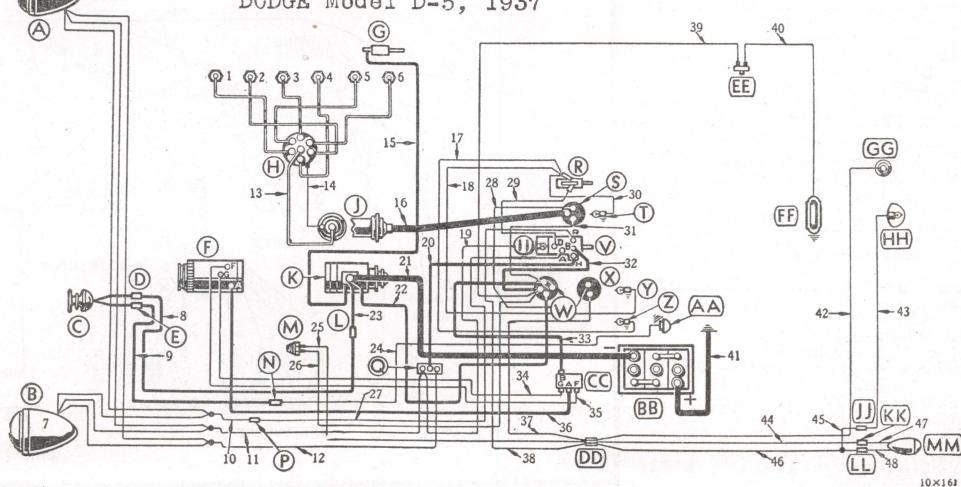
BATTERY

Amps.—95 amp. hr.

LAMPS

Head—32-32 c. p., No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.

DODGE Model D-5, 1937



Ford V8, 1938

MODELS 60 and 85

ENGINE

DATA

No. of Cylinders—V-60, 8; V-85, 8.
Bore—V-60, 2.6"; V-85, $3\frac{1}{16}$ ".
Stroke—V-60, 3.2"; V-85, $3\frac{3}{4}$ ".
Taxable H. P.—V-60, 21.6; V-85, 30.0.
Displacement—V-60, 136 cu. in.; V-85, 221 cu. in.
Firing Order—1-5-4-8-6-3-7-2.
Max. H. P.—V-60, 60 at 4200 r.p.m.; V-85, 85 at 3800 r.p.m.

CAMSHAFT

Drive—Gears.
Chain Data—Not given.
Valve Timing—Mark on crankshaft gear meshed with mark on camshaft gear.
Bearings—3, steel-backed babbitt.
End Thrust Taken On—Front end.
Bearing Clearance—.0015"--.0025".

CONNECTING RODS

End Clearance—.010".
Dia. Clearance—.002"--.003" (total).

COOLING SYSTEM

Capacity—V-60, 3.8 gal.; V-85, $5\frac{1}{2}$ gals.
Pump Drive—Belt.
Belt Size—V-60, $45\frac{3}{4}$ " x $5\frac{5}{8}$ "; V-85, $51\frac{1}{4}$ " x $5\frac{5}{8}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Steel-backed, special alloy.
End Thrust Taken On—Rear bearing.
End Clearance—.002"--.006".
Dia. Clearance—.0005"--.0025".

FUEL SYSTEM

Carburetor Make—Stromberg "EE."
Type—Dual downdraft.
Adjustment—Idle adjustment, turn in for lean, out for rich mixture.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—V-60, 4 qts.; V-85, 5 qts.
Oil Pressure—30 lbs. at 30 m.p.h.
Adjustment—Non-adjustable.
Oil { Average above 90°—S.A.E. 40
Min. above 32°—S.A.E. 30
Min. above 10°—S.A.E. 20 or 20W.
Min. above —10°—S.A.E. 10 or 10W.
Lower temperatures....10W. diluted
with kerosene.

PISTONS

Material—Steel, heat-treated.
Clearance—Top—Not given.
Clearance—Bottom—V-60, .002";
.0025" feeler—5 to 10 pull.
V-85, .002"; .003 feeler—5 to 10 pull.

PISTON RINGS

Gap—Comp. .009" min.; Oil, .005" min.
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—1.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—V-60, .0002"--.0008";
V-85, .0003"--.0009".
Fit in Rod—.0002".

VALVES AND TAPPETS

Dia. Exhaust—V-60, 1.28"; V-85, 1.53".
Stem Dia.—V-60, .279"; V-85, .311".
Seat Dia.—V-60, .279"; V-85, .311".
Seat Angle—45°.
Seat Width— $\frac{3}{32}$ " max.
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.0125";
.0135" cold.
Exhaust—.0125" .0135" cold.
Guides Removable—Yes.
Spring Pressure—V-60—26-30 lbs. at 2.05"; 45-52 lbs. valve open.
V-85—35-38 lbs. at 2.13"; 67-72 lbs. valve open.

CHASSIS

FRONT AXLE

Caster—8°.
Camber—1°.
Toe-in— $\frac{1}{16}$ ".
Kingpin Angle—8°.
Tie Rod Adj.—Thread.

REAR AXLE

Type— $\frac{3}{4}$ floating spiral bevel.
Pinion Bearing Type—Timken—799056-799055.
Adjustment—Screw.
End Play—Tension 12 to 17 inch pounds.
Lash—.010".
Diff. Bearing Type—Timken 799115-799116.
Adjustment—Non-adjustable.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Own.
Main Shaft Bearing Type and No.—Fed. 1208CG and 1306CG.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Mechanical four-wheel, cable control.
Lining Type—Moulded.
Lining Size— $26\frac{1}{2}$ " x $1\frac{3}{4}$ " x $1\frac{1}{16}$ ".
Adjustments—Adjusting screw operating.
Adjusting wedge for clearance.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Single plate.
Facing Type—V-60, woven; V-85, moulded.
Pilot Bearing Type and No.—Fed. 1203 FO.
Throwout Bearing Type and No.—Nice 5877.

SPRINGS

Type Front—Transverse semi-elliptic.
Type Rear—Transverse semi-elliptic.
Shackle Adjustment—Oil-less type.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Mesh and cross-shaft end play—adjusting screw side cover.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Own.
Drive—Bendix.
Rotation—Counter-clockwise.
No Load—45-60 amps.
Lock Torque—14 ft. lbs., 500 amps., 4.8 volts.
Brush Spring Tension—32-oz.

GENERATOR

Make—Own.
Drive—Belt.
Regulation—3rd brush.
Thermostat—None.
Output, cold—18 amps, 6 volts, 1600 r.p.m.
Output, hot—15 amps.
Brush Spring Tension—20 oz.
Rotation—Clockwise.
Cutout to Close—7.0 volts at 10 m.p.h.
Amps. Discharge to Open—3.0.
Field Fuse—None.

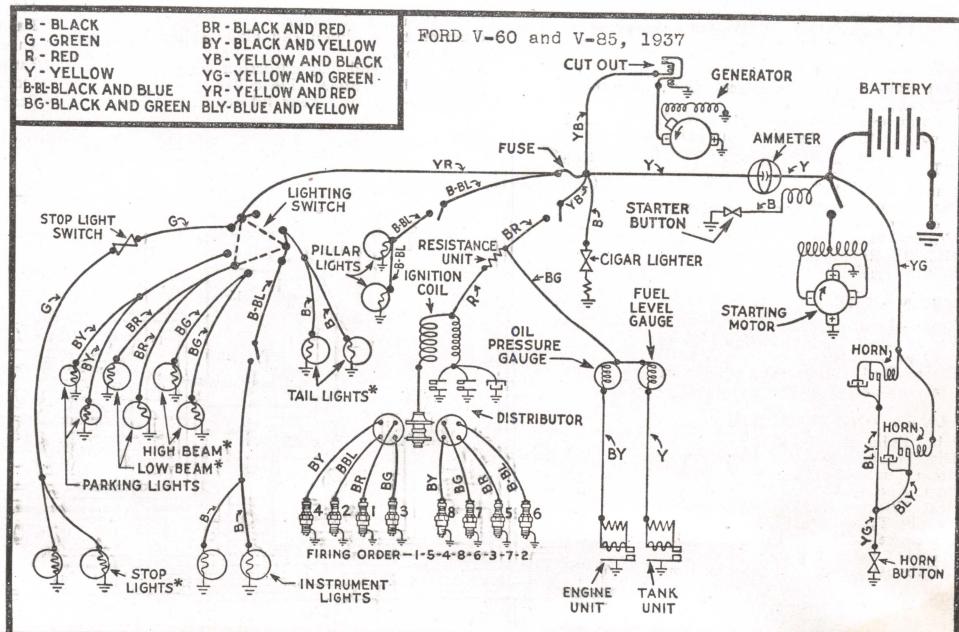
IGNITION

Coil—Own in distributor.
Distributor—Own.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.014"—.016".
Brush Spring Tension—20-24 oz.
Spark Plug Gap—.025".
Spark Plug Size—V-60, Champion "H10," 14 m.m.; V-85, Champion No. 7, 18 m.m.
Manual Advance—None.
Automatic Advance—20°.
Timing—4° below top dead center, initial advance.
Coil Amps., Engine Idling—2.8.
Coil Amps., Engine Stopped—4.0.

BATTERY

LAMPS

Amps.—100 amp. hr.
Head—32-32 c. p.
Park—1.5 c. p.
Instrument—3 c. p.
Fuse—Not specified.
Dome—3 c. p.
Stop and Tail—21 c. p. and 3 c. p.



Ford V-8, 1937

85 and 60 HORSEPOWER

ENGINE

DATA

No. of Cylinders—8.
Bore—3.062"; "60"—2.600".
Stroke—3.75"; "60"—3.200".
Taxable H. P.—30.0; "60"—21.63.
Displacement—221; "60"—136 cu in.
Firing Order—1-5-4-8-6-3-7-2.
Max. H. P.—85 at 3800; 60 at 4200 r.p.m.

CAMSHAFT

Drive—Helical gears.
Valve Timing—Mark on crankshaft gear tooth meshed at mark on camshaft gear.
Bearings—3, steel-backed babbitt-lined.
End Thrust Taken On—Front end.
Bearing Clearance—.0015"--.0025".

CONNECTING RODS

End Clearance—.010".
Dia. Clearance—.003".

COOLING SYSTEM

Capacity—5½ gal.; "60"—3.80 gal.
Pump Drive—V-belt.
Belt Size—V-type—51.2" x 0.63" wide;
"60"—45.8" long, 0.63" wide.
Belt Adjustment—Generator mounting.
Pump Pack, Adj.—Automatic.

CRANKSHAFT

No. Bearings—3, replaceable.
Material—Special alloy, steel-backed.
End Thrust Taken On—Rear main bearing.
End Clearance—.002"--.006".
Dia. Clearance—.0005"--.0025".

FUEL SYSTEM

Carburetor Make—Stromberg, 0.97" venturi;
"60"—0.81" venturi.
Type—Dual downdraft.
Adjustment—Turning out gives a richer mixture; in, a leaner mixture.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.; "60"—4 qts.
Oil Pressure—30 lbs. at 2600; "60"—30 lbs.
3200 engine.
Adjustment—Non-adjustable.
Above 90° F.....S.A.E. 50
100° F—30° F.....S.A.E. 40
65° F—20° F.....S.A.E. 30
Oil 50° F—0° F.....S.A.E. 20 or 20 W
30° F—15° F.....S.A.E. 10 or 10 W
10° F. or lower.....S.A.E. 10W plus
10% kerosene

PISTONS

Material—Steel alloy, heat treated.
Clearance—Top—Not specified.
Clearance Bottom—.003" feeler, 8 to 12 lbs. pull; "60"—.0025" feeler, 8 to 12 lbs. pull.

PISTON RINGS

Gap—Comp., .009-.015"; oil, .005"- .015".
No. Comp. Rings—2.
Width—.0915"--.092".
No. Oil Rings—1.
Width—.1545"--.1555".

PISTON PINS

Type—Floating.
Fit in Piston—.0003"--.0009"; "60"— .0002"--.0008".
Fit in Rod—.0002".

VALVES AND TAPPETS

Dia. Exhaust—1.537"; "60"—1.281".
Dia. Intake—1.537"; "60"—1.281".
Stem Dia.—.3105"--.3115"; "60"— .2785"--.2795".
Seat Angle—45°.
Seat Width— $\frac{5}{32}$ " max.
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.013" cold.
Exhaust—.013" cold.
Guides Removable—Yes.
Spring Pressure—35-38 lbs., valve closed—2.13" 65-72 lbs., valve open.
"60"—26-30 lbs., valve closed—2.05"; 48-52 lbs., valve open.

CHASSIS

FRONT AXLE

Caster—9° max., 4½° min.
Camber—1° max., $\frac{1}{4}$ ° min.
Toe-in— $\frac{1}{16}$ ".
Kingpin Angle—8°.
Tie Rod Adj.—Thread.

REAR AXLE

Type— $\frac{3}{4}$ floating spiral bevel.
Pinion Bearing Type—Taper roller and straight roller.
Adjustment—Screw.
End Play—Tension, 12 to 17 inch pounds.
Lash—.010" max.
Diff. Bearing Type—Tapered roller.
Adjustment—Non-adjustable.
End Play—Not given.
Lubricant Capacity—Housing—2½-3 pts.

TRANSMISSION

Make and Type—Own, synchro-mesh, all helical gear; "60"—helical second speed gears.
Main Shaft Bearing Type and No.—N. D. 43208 and 43306.
Countershaft Bearing Type and No.—Hyatt 99026.

BRAKES

Type—4-wheel, mechanical cable operated.
Lining Type—Semi-moulded.
Lining Size—26½" x 1¾" x $\frac{3}{16}$ ".
Adjustments—Adjusting screw operating.
Adjusting wedge for clearance.
Clearance
Top—.005" with concentricity gauge.
Bottom—.003" with concentricity gauge.
Brake Effort—50-50.

CLUTCH

Type—Single plate.
Facing Type—Asbestos moulded.
Pilot Bearing Type and No.—Pre-lubricated, ball-bearing.
Throwout Bearing Type and No.—Pre-lubricated, thrust bearing, Nice 5015-1.

SPRINGS

Type Rear—Transverse semi-elliptic.
Type Front—Transverse semi-elliptic.
Shackle Adjustment—Oil-less type.

STEERING GEAR

Type—Worm and roller.
Adjustments
Column end play—shims under lower cover.
Cross-shaft—adjusting screw.
Mesh—adjusting screw at bottom.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Own.
Drive—Bendix.
Rotation—Counter-clockwise.
No Load—45 to 60 amps.
Lock Torque—14 ft. lbs., 500 amps., 4.8 volts.
Brush Spring Tension—32 oz.

GENERATOR

Make—Own.
Drive—Belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—18 amps., 6.2 volts, 1600 r.p.m.
Output, hot—Max. 15 amps.
Brush Spring Tension—20-24 oz.
Rotation—Clockwise.
Cutout to Close—7 volts at 10 m.p.h.
amps. Discharge to Open—3.0.
Field Fuse—None.

IGNITION

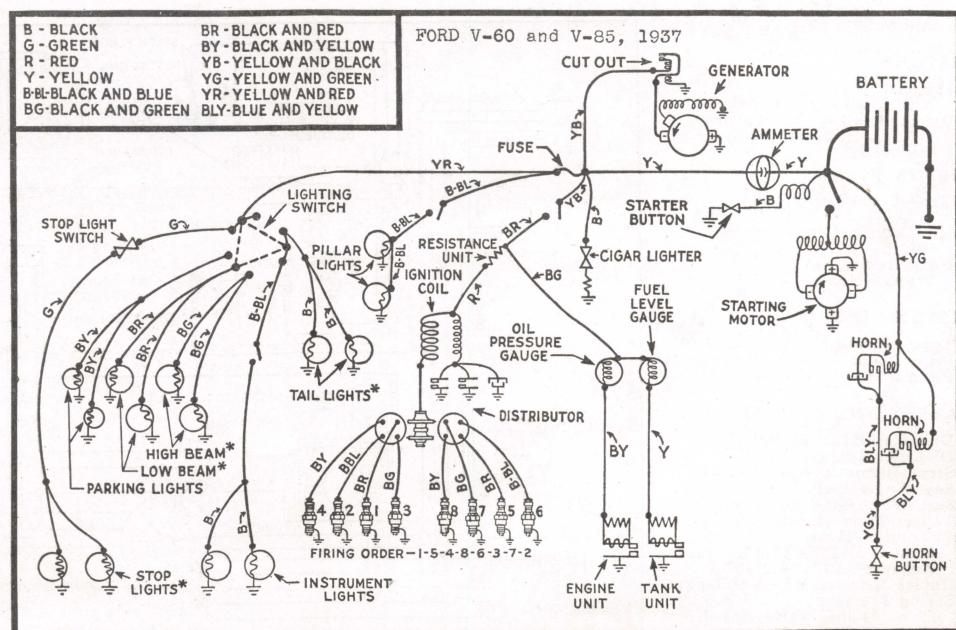
Distributor—Own.
Coil—Own in distributor.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.014"--.016".
Brush Spring Tension—20-24 oz.
Spark Plug Gap—.025".
Spark Plug Size—18 m/m Champion "7"; "60"—14 m/m Champion "H10."
Manual Advance—None.
Automatic Adv.—200 at 3000 engine r.p.m.
Timing—4° before top dead center, initial advance.
Coil Amps., Engine Idling—2.8.
Coil Amps., Engine Stopped—4.0.

BATTERY

Amps.—100 amp. hrs.

LAMPS

Head—32-32 C. P.
Park—1.5 C. P.
Instrument—3 C. P.
Fuse—Not specified.
Dome—3 C. P.
Stop and Tail—3 C. P. and 21 C. P.



Ford V-8, 1935

ENGINE

Taxable H. P.—30.

DATA

No. of Cylinders—8.
Bore—3.062" ($3\frac{1}{16}$ "). Stroke— $3\frac{3}{4}$ ".
Displacement—221 cu. in.
Firing Order—1-5-4-8-6-3-7-2.
Maximum H. P.—90 at 3800 r.p.m.

CAMSHAFT

Drive—Gear.
Chain Data—Crankshaft gear, steel; cam-shaft gear, Bakelite fabric.
Valve Timing—Punch mark on camshaft gear in line with tooth marked "Ford."
Bearings—3.
End Thrust—Taken on front end.
Bearing Clearance—.0015"-.0025".

CONNECTING RODS

Copper lead, floating type.
End Clearance—.010"-.022".
Diameter Clearance—.003".

COOLING SYSTEM

Capacity—5 gallons.
Pump Drive—Fan belt.
Belt Size—28" V., $5\frac{1}{4}$ " x .63".
Belt Adjustment—Generator mounting.
Pump Packing Adjustment—Packless type.

CRANKSHAFT

No. Bearings—3.
Material—Babbitt cast in crankcase and cap.
End Thrust—Taken on rear bearing.
End Clearance—.002"-.006".
Diameter Clearance—.001"-.003".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Dual downdraft.
Adjustment—Idle adjustment only; high speed, fixed jets.
Fuel Delivery—A. C. mechanical pump.

LUBRICATION

Type—Pressure-ventilated crankcase.
Pump Type—Gear.
Capacity—5 quarts.
Oil Pressure—30 lbs. at 55 m.p.h.
Adjustment—Non-adjustable.
Winter Oil:
Below 0°, S. A. E. 10 or 10W.
Below freezing, S. A. E. 20 or 10W.
Summer Oil:
Above freezing, S. A. E. 40.
Above 90°, S. A. E. 50.

PISTONS

Material:
Aluminum alloy, split skirt.
Clearance—Top, not specified.
Bottom, .002".

PISTON RINGS

Gap—Compression, .009"-.015".
Oil—.005"-.009".
No. Compression Rings—2.
Width—.092".
No. Oil Rings—1.
Width—.155".

PISTON PINS

Type—Floating (snap-ring in rod).
Fit in Piston—.0002", piston heated
Fit in Rod—.0002"-.0004".

VALVES AND TAPPETS

Diameter Exhaust—1.537".
Diameter Intake—1.537".
Seat Diameter—.3105"-.3115".
Seat Angle—45°.
Seat Width— $\frac{3}{8}$ " maximum.
Tappet Type—Mushroom.
Clearance—Hot:
Intake—.0125"-.0135".
Exhaust—.0125"-.0135".
Guides Removable?—Yes (split).
Spring Pressure:
39 to 44 lbs., valve closed.
62 to 65 lbs., valve open.

CHASSIS

FRONT AXLE

Caster—7° loaded.
Camber—2°.
Toe-in—.06" ($\frac{1}{16}$ ").
Kingpin Angle—7°.
Tie Rod Adjustment—Thread.

REAR AXLE

Type— $\frac{3}{4}$ floating.
Pinion Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Correct adjustment, 20 to 25 in lbs.
Lash—.006"-.010".
Differential Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.001"-.004".
Lubricant Capacity Housing— $2\frac{1}{2}$ to 3 pints

TRANSMISSION

Make and Type—Own, synchro-mesh.
Main Shaft Bearing Type and No.:
N.D.-43208-43306.
Countershaft Bearing Type and No.:
Hyatt, 93324.

BRAKES

Type—Own, mechanical.
Lining Type—Semi-molded.
Lining Size— $2\frac{1}{2}$ " x $1\frac{3}{4}$ " x .185" per wheel.
Adjustments:
Adjust cold; adjusting screw on backing plate; linkage adjustment for lever location.
Clearance—Top, .010".
Bottom, .010".
Brake Effort—50/50.

CLUTCH

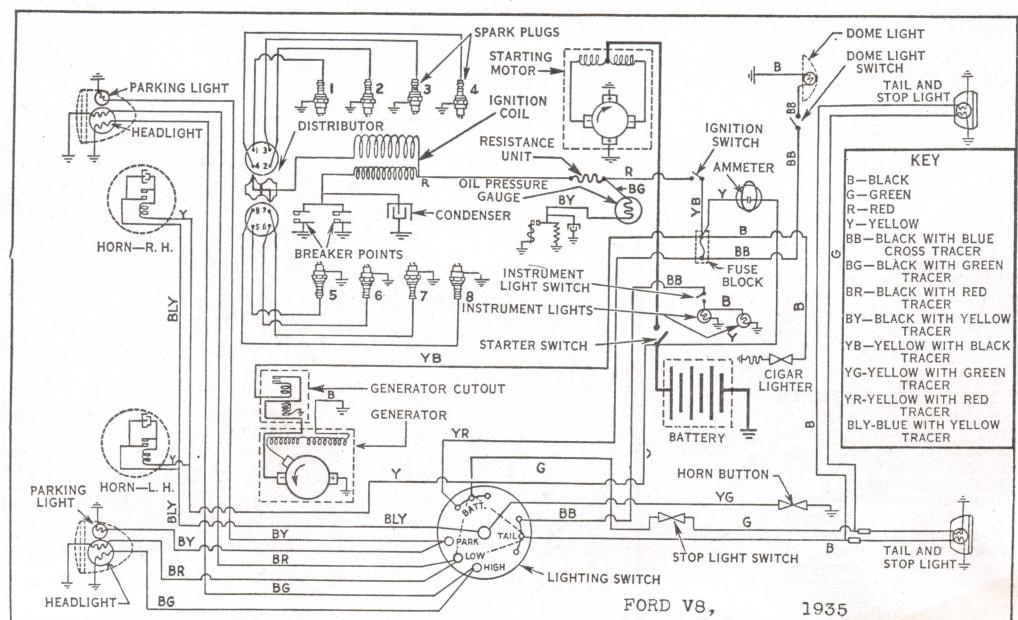
Type—Centrifugal, single-plate.
Facing Type—Molded.
Pilot Bearing Type and No.—N.D.-7503.
Throwout Bearing Type and No.:
Nice, 5015-1.

SPRINGS

Type Front—Transverse cantilever.
Type Rear—Transverse cantilever.
Shackle Adjustment—Oilless.

STEERING GEAR

Type—Worm and sector.
Adjustments:
Column end play, adjusting nut.
Cross-shaft, adjusting screw.
Mesh, eccentric.
Lubricant—Fluid gear lubricant.



FORD V8, 1935

Ford V8, 1934

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{8}$ ". Stroke— $3\frac{3}{4}$ ".
Taxable H. P.—30.
Displacement—221 cu. in.
Firing Order—1-5-4-8-6-3-7-2.
Maximum H. P.—90 at 3,800 r.p.m.

CAMSHAFT

Drive—Gear.
Valve Timing Checked—Timing marks on gears; punch on cam gear in line with tooth marked "Ford."
Bearings—in crankcase.

CONNECTING ROD

End Clearance—.010"-.022".
Diameter Clearance—.003".

COOLING SYSTEM

Capacity— $5\frac{1}{2}$ gallons.
Pump Drive—Belt.
Belt Size— 28° Vee, $\frac{5}{8}$ " wide.
Belt Adjustment—Generator mounting.
Pump Packing Adjustment—Nut.

CRANKSHAFT

No. Bearings—3.
Material—Babbitt, integral with cap and case.
End Thrust—Taken on rear.
End Clearance—.002"-.006".
Diameter Clearance—.001"-.003".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Dual, downdraft.
Adjustment—Idle screw; for high speed adjustments, change jets.
Fuel Delivery—Pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 quarts.
Oil Pressure—30 lbs. at 55 m.p.h.
Adjustment—Relief valve opens 30 lbs.
Winter Oil—S. A. E. No. 10 or No. 20.
Summer Oil—S. A. E. No. 40 or No. 50.

PISTONS

Material—Aluminum.
Clearance—Bottom, .002".

PISTON RINGS

Gap—Oil Ring, .005"-.009".
Compression Ring, .009"-.015".
No. Compression Rings—2.
Width—.0915"-.092".
No. Oil Rings—1.
Width—.1545"-.155".

PISTON PINS

Type—Floating (snap ring in rod).
Fit in Piston—.0002".
Fit in Rod—.0005".

VALVES AND TAPPETS

Diameter Exhaust—1.537".
Diameter Intake—1.537".
Seat Diameter—.3105"-.3115".
Seat Angle—45°.
Seat Width— $\frac{3}{8}$ " max.
Tappet Type—Hollow mushroom.
Clearance—Hot: Intake, .013".
Exhaust, .013".
Guides Removable?—Yes (split).
Spring Pressure:
40-42 lbs., valve closed

CHASSIS

FRONT AXLE

Caster— $8\frac{3}{4}^{\circ}$ loaded.
Camber— 2° .
Toe-in— $\frac{1}{8}$ ".
Kingpin Angle—7°.
Tie Rod Adjustment—Thread.

REAR AXLE

Type— $\frac{3}{4}$ floating.
Pinion Bearing Type—Timken.
Adjustment—Nuts on pinion shaft.
End Play—Correct adjustment, 20 to 25 inch lbs.
Lash—.006"-.010".
Differential Bearing Type—Timken.
Adjustment—Shims.
End Play—.001"-.004".
Lubricant Capacity Housing— $1\frac{1}{2}$ pints.

TRANSMISSION

Make and Type—Own, syncro-mesh.
Main Shaft Bearing Type and No.—Fafnir, 306-G.
Countershaft Bearing Type and No.—Hyatt, 93324.

BRAKES

Type—Mechanical internal.
Lining Type—Molded.
Lining Size— $1\frac{1}{2}$ " x .172".
Adjustments—Adjust cold; adjusting screw on backing plate.
Clearance—Top, .010".
Bottom, .010".

CLUTCH

Type—Single-plate, dry.
Facing Type—Molded.
Pilot Bearing Type and No.—Ball, No. 203.
Throwout Bearing Type and No.—Nice, No. 5015-Y.

SPRINGS

Type Front—Transverse cantilever.
Type Rear—Transverse cantilever.

STEERING GEAR

Type—Worm and sector.
Adjustments:
Worm Shaft—Adjusting nut top of housing.
Cross Shaft—Adjusting screw.
Gear Mesh—Eccentric.
Lubricant—Fluid steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Bendix.
Rotation—Counter-clockwise.
Lock Torque—14 ft. lbs., 225 amps., 3 volts
Brush Spring Tension—2 lbs.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Third brush.
Thermostat—None.
Output—Cold, 12 amps., 25 m.p.h.
Hot, 10 amps., 25 m.p.h.
Brush Spring Tension—20 oz.
Cutout to Close—7 volts at 10 m.p.h.
Amps. Discharge to Open—3.

IGNITION

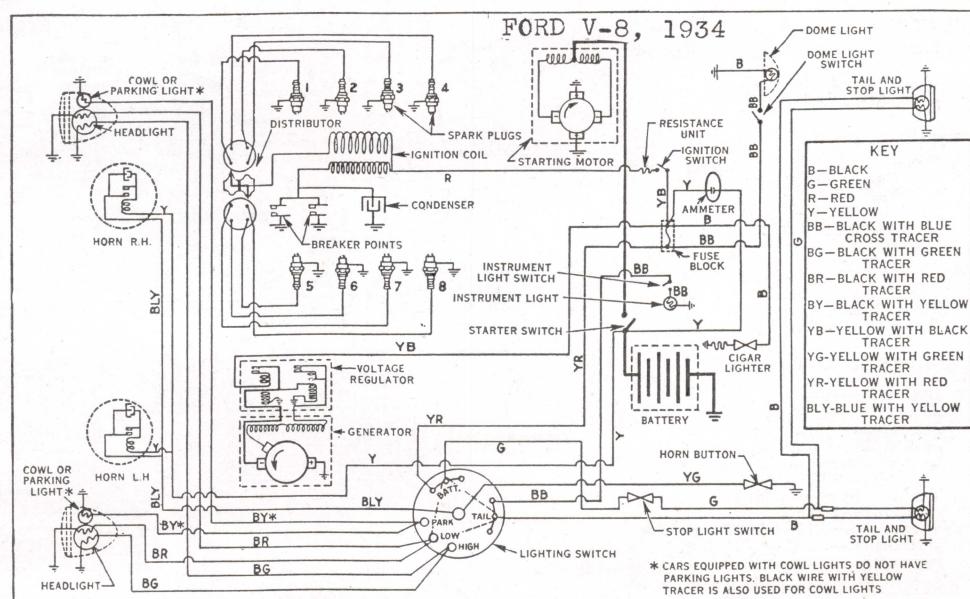
Distributor—Mallory (centrifugal governor, vacuum retard).
Coil—Mallory.
Breaker Gap—.012"-.014".
Brush Spring Tension—22-27 oz.
Spark Plug Gap—.025".
Spark Plug Size—18 mm.
Manual Advance—None.
Automatic Advance— 20° maximum at 3,000 r.p.m.
Timing— 4° before top center.
Coil Amps., Engine Idling—2.8.
Engine Stopped, 4.

BATTERY

Amps.—120 amp. hrs.; 17-plate.

LAMPS

Head—Mazda, No. 1000.
Park—Mazda, No. 63.
Instrument—Mazda, No. 81.
Dome—Mazda, No. 63.
Stop and Tail—Mazda, No. 1158.



* CARS EQUIPPED WITH COWL LIGHTS DO NOT HAVE PARKING LIGHTS. BLACK WIRE WITH YELLOW TRACER IS ALSO USED FOR COWL LIGHTS

Graham Supercharger, 1938

(Also SPECIAL SIX, MODEL 96)

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—25.35.
Displacement—217.8 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—116 at 4000 r.p.m., Supercharger; 90 at 3600, Special Six.

CAMSHAFT

Drive—Link-belt chain.
Chain Data—46 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Flywheel mark "EC-I" and exhaust valve opening or 9 links or 10 pins between marks on sprockets with No. 1 and No. 6 pistons on top center.
Bearings—4, steel-backed babbitt.
End Thrust Taken On—Thrust plate.
Bearing Clearance—.002"- .004".

CONNECTING RODS

End Clearance—.005".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity— $15\frac{1}{2}$ qts.
Pump Drive—Fan belt.
Belt Size— $38\frac{1}{2}$ V— $44\frac{1}{2}$ " x $2\frac{1}{2}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Cadmium silver in steel shell.
End Thrust Taken On—Front bearing.
End Clearance—.005".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Marvel.
Type—Single downdraft.
Adjustment—Turn in for lean; out for richer mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30 lbs. at 30 m.p.h.
Adjustment—Shims under relief valve spring.
Winter Oil—S.A.E. 20W. and 10W.
Summer Oil—S.A.E. 30 and 40.

PISTONS

Material—Alum. alloy, steel strut, plated.
Clearance—Top—.012".
Clearance—Bottom—.0025".

PISTON RINGS

Gap—.010".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width—One $\frac{5}{32}$ " and one $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0005".
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $12\frac{1}{4}$ ".
Dia. Intake— $13\frac{3}{4}$ ".
Stem Dia.— $5\frac{1}{16}$ ".
Seat Angle—Int., 30° ; Exh., 45° .
Seat Width—Int., $\frac{1}{16}$ " + $0\frac{1}{16}$ "; Exh., $\frac{9}{64}$ " + $\frac{1}{16}$ ".
Tappet Type—Cylindrical.
Clearance—Hot:
Intake —.010" } .012" for valve
Exhaust—.010" } timing.
Guides Removable—Yes.
Spring Pressure—34 lbs., valve closed.
87 lbs., valve open.

CHASSIS

FRONT AXLE

Caster— 3° - 4° .
Camber— 1° .
Toe-in— $\frac{1}{8}$ ".
Kingpin Angle— $7\frac{1}{2}^\circ$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Timken 02820-02872 and 31520-31593.
Adjustment—Shims.
End Play—Not given.
Lash—.004"- .008".
Diff. Bearing Type—Timken 25523-25577.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Warner 3-speed, helical.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size— $23\frac{1}{2}$ " x $1\frac{3}{4}$ " x $\frac{1}{4}$ ".
Adjustments—Hand brake, $17\frac{3}{4}$ " x $2\frac{1}{2}$ " x $\frac{5}{32}$ ".
Cam for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.006".
Hand Brake—.025".
Brake Effort—50-50.

CLUTCH

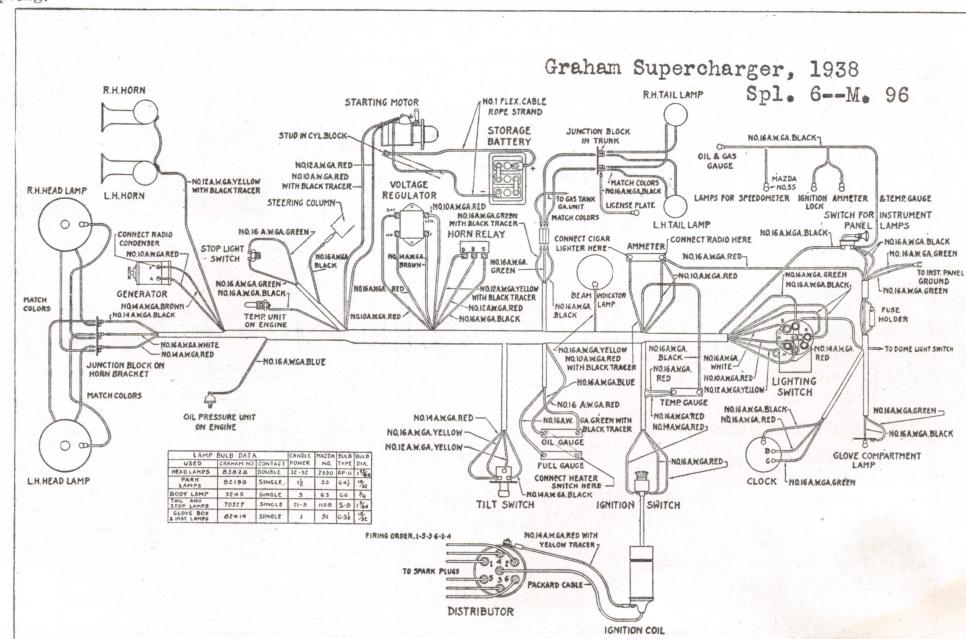
Type—Long, semi-centrifugal.
Facing Type—Moulded.
Pilot Bearing Type and No.—Bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Eaton rubber.

STEERING GEAR

Type—Cam and lever, dual stud.
Adjustments—Column end play—shims under top cover.
Cross-shaft end play—adjusting screw in side cover.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 738-T, 738-X.
Drive—Manual gear.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco Remy 1100455, 1100007.
Drive—Belt.
Regulation—No. 1100007, voltage regulator; No. 1100455, current regulator.
Thermostat—None.
Output, cold—No. 1100007, 26-30 amps., 8.0 volts, 3400 r.p.m.; No. 1100455, 18-21 amps., 8.2-8.3 volts, 2400 r.p.m.
Output, hot—No. 1100007, 25-28 amps., 8.0 volts, 3600 r.p.m.; No. 1100455, 15-18 amps., 7.9-8.3 volts, 2900 r.p.m.
Brush Spring Tension—Main, 22-26 oz.; third brush, 16-20 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5-7.0 volts.
Amps. Discharge to Open—3.0 amps., 6.3 volts, reverse current.
Field Fuse—6 amps.

IGNITION

Distributor—Delco-Remy 623A-623S.
Coil—Delco-Remy.
Distr. Rotation—Clockwise, viewing drive end.
Breaker Gap—.018"- .024".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.025".
Spark Plug Size—14 m/m Champion "J-9."
Manual Advance—623A, none; 623S, 10° engine.
Automatic Advance—623A, 18° engine at 2800 r.p.m.; 623S, 16° engine at 2000 r.p.m.
Vacuum Advance—10°.
Timing—4° before top dead center or exhaust "EC-I" on Supercharger. Top dead center on Special Six.
Coil Amps., Engine Idling—1.8.
Coil Amps., Engine Stopped—3.0.

BATTERY

Amps.—105 amp. hr.

LAMPS

Head—No. 2330.
Park—No. 55.
Instrument—No. 55.
Fuse—Not given.
Dome—No. 63.
Stop and Tail—No. 87 and No. 63.

Graham Cavalier

SERIES 95, 1937

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—25.35.
Displacement—199.1 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—85 at 3300 r.p.m.

CAMSHAFT

Drive—Linkbelt chain.
Chain Data—46 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Flywheel mark and exhaust valve opening.
Bearings—4, steel babbitt lined.
End Thrust Taken On—Thrust plate.
Bearing Clearance—.002".-.004".

CONNECTING RODS

End Clearance—.005".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity—15 qts.
Pump Drive—Belt.
Belt Size— $38\frac{1}{2}$ " x 43.3" long, $1\frac{1}{16}$ " wide.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel shell, cadmium-silver lining.
End Thrust Taken On—Front bearing.
End Clearance—.004".-.006".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Marvel.
Type—Downdraft single.
Adjustment—Turn adjustment out for rich; in, for leaner mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—40 lbs. at 30 m.p.h.
Adjustment—Shims under relief valve spring.
Winter Oil—S.A.E. 20W. or 10W.
Summer Oil—S.A.E. 30 or 40.

PISTONS

Material—Alum. alloy—Plated with struts.
Clearance—Top—.024".-.030".
Clearance—Bottom—.0025".

PISTON RINGS

Gap—.007".-.017".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width—Upper $\frac{5}{16}$ ", Lower $\frac{5}{32}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0005".
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{16}$ ".
Dia. Intake— $1\frac{3}{16}$ ".
Seat Dia.— $\frac{5}{16}$.
Seat Angle—Int., 30°; Exh., 45°.
Seat Width— $\frac{1}{16}$ "
Inlet, $\frac{1}{16}$ "— $\frac{1}{16}$ "; Exh., $\frac{5}{16}$ "— $\frac{1}{16}$ "
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.010".
Exhaust—.010".
(.012" for valve timing)
Guides Removable—Yes.
Spring Pressure—
34 lbs. valve closed.
87 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $4^{\circ}4\frac{1}{2}$ ".
Camber—1".
Toe-in— $\frac{1}{8}"$ — $\frac{3}{16}"$.
Kingpin Angle— $7\frac{1}{2}$ ".
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating—spiral bevel.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lash—.004"—.008".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Warner gear—3-speed.
Main Shaft Bearing Type and No.—Ball
No. 1305 CGF.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size— $18"$ x $1\frac{3}{4}"$ x $\frac{3}{16}"$.
Hand Brake— $1\frac{3}{4}"$ x $2"$ x $\frac{5}{32}"$.
Adjustments—Cam adjustment for lining wear. Eccentric anchor adjustment.
Clearance—Top—.005".
Bottom—.010".
Hand Brake— $1\frac{3}{2}"$.
Brake Effort—50-50.

CLUTCH

Type—Single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—Bronze oilite.
Throwout Bearing Type and No.—Ball
BCA No. 4129B.

SPRINGS

Type Rear—Semi-elliptic.
Type Front—Semi-elliptic.
Shackle Adjustment—Rubber cushioned.

STEERING GEAR

Type—Ross cam and lever.
Adjustments—Column end play—shims.
Cross-shaft end play—adjusting screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy, 738-T.
Drive—Manual gear, overrunning clutch.
Rotation—Clockwise viewing drive end.
No Load—65 amps., 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63
volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy, 948-B.
Drive—Belt.
Regulation—Field resistance controlled by lighting switch.
Thermostat—None.
Output, cold—21 amps., 8.5 volts, 2400
r.p.m.
Output, hot—18 amps., 8.3 volts, 2900 r.p.m.
Brush Spring Tension—Main, 22-26 oz.;
Third, 16-20 oz.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.75-7.5 volt.
Amps. Discharge to Open—0-2.5.
Field Fuse—6 amps.

IGNITION

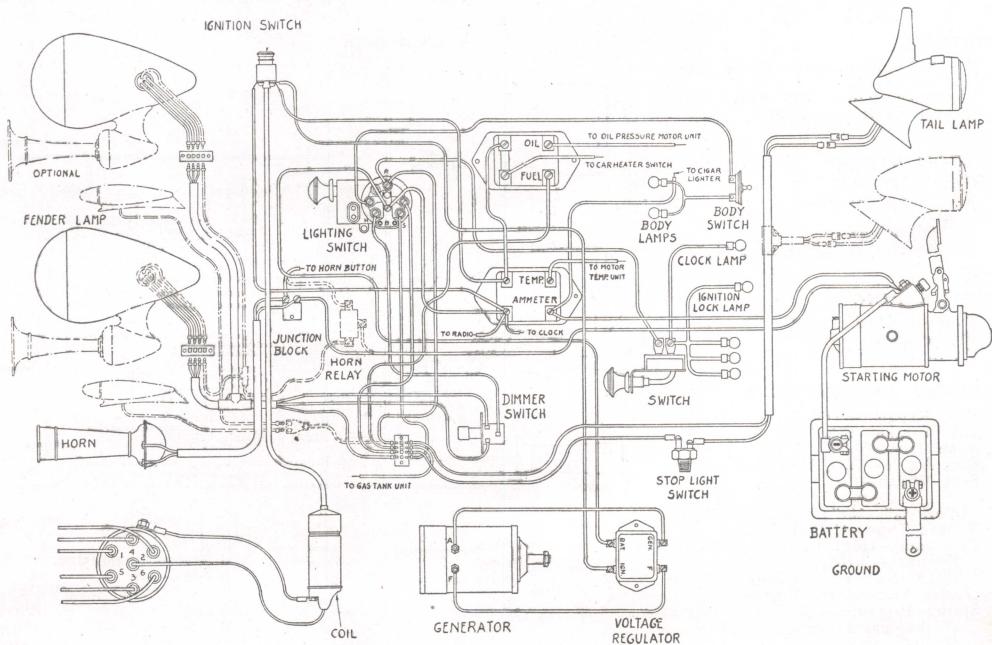
Distributor—Delco-Remy, 623-A.
Coil—Delco-Remy, 536-J.
Distr. Rotation—Clockwise viewing drive end of distributor.
Breaker Gap—.018"—.024".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.025".
Spark Plug Size—Champion J-9, 14 m/m.
Manual Advance—None.
Automatic Advance— 18° engine at 2800
r.p.m.
Vacuum Adv.— 10° .
Timing—Top dead center.
Coil Amps., Engine Idling—1.8.
Coil Amps., Engine Stopped—3.0.

BATTERY

Amps.—Willard, 90 amp. hr.

LAMPS

Head—32-21 C. P.
Park—No. 55.
Instrument—No. 55.
Fuse—Not specified.
Dome—No. 63.
Stop and Tail—No. 87 and No. 63.
Ignition Lock—No. 51.



Graham Crusader

SERIES 85, 1937

ENGINE

DATA

No. of Cylinders—6.
Bore—3".
Stroke—4".
Taxable H. P.—21.6.
Displacement—169.6 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—70 at 3500 r.p.m.

CAMSHAFT

Drive—Linkbelt chain.
Chain Data—46 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Flywheel marks and exhaust valve opening.
Bearings—4, front and rear replaceable.
End Thrust Taken On—Thrust plate.
Bearing Clearance—.002"- .004".

CONNECTING RODS

End Clearance—.004"- .006".
Dia. Clearance—.001"- .002".

COOLING SYSTEM

Capacity—11 qts.
Pump Drive—Belt.
Belt Size—38° V—40" long, $2\frac{1}{2}$ " wide.
Belt Adjustment—Fan mounting.
Pump Pack Adj.—Packless type pump.

CRANKSHAFT

No. Bearings—4.
Material—Steel shell—Cadmium silver lined.
End Thrust Taken On—Front bearing.
End Clearance—.005".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Marvel.
Type—Downdraft single.
Adjustment—Turn adjustment out for rich; in, for leaner mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear
Capacity—5 qts.
Oil Pressure—40 lbs. at 30 m.p.h.
Adjustment—Washer as required under relief valve spring.
Winter Oil—S.A.E. 20W or 10W.
Summer Oil—S.A.E.—30 or 40.

PISTONS

Material—Alum. alloy—Plated with struts.
Clearance—Top—.024"- .030".
Clearance—Bottom—.002".

PISTON RINGS

Gap—.007"- .012".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width—Upper $\frac{5}{16}$ ", Lower $\frac{5}{32}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0005".
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{16}$ ".
Dia. Intake— $1\frac{3}{16}$ ".
Stem Dia.— $\frac{5}{16}$ ".
Seat Angle—Int., 30°; Exh., 45°.
Seat Width— $\frac{1}{16}$ " + $\frac{1}{16}$ "
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.010".
Exhaust—.010".
(.012" for valve timing)
Guides Removable—Yes.
Spring Pressure—
34 lbs. valve open.
87 lbs. valve closed.

CHASSIS

FRONT AXLE

Caster— $4\frac{1}{2}$ °— $5\frac{1}{2}$ °.
Camber— $1\frac{1}{2}$ °.
Toe-in— $\frac{1}{8}$ "— $\frac{3}{16}$ ".
Kingpin Angle— $7\frac{1}{2}$ °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating spiral bevel.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lash—.004"—.008".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—2 pts.

TRANSMISSION

Make and Type—Warner gear, 3-speed.
Main Shaft Bearing Type and No.—No. 1207 and No. 1305 Ball.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size— $18\frac{1}{2}$ " x $1\frac{3}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Can adjustment for lining wear. Eccentric anchor adjustment.
Clearance—Top—.010".
Bottom—.005".
Brake Effort—50-50.

CLUTCH

Type—Single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—Bronze.
Throwout Bearing Type and No.—Ball bearing.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Rubber cushioned.

STEERING GEAR

Type—Ross cam and lever.
Adjustments—Column end play—shims.
Cross-shaft end play—adjusting screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy, 738-V.
Drive—Manual gear, over-running clutch.
Rotation—Clockwise viewing drive end.
No Load—65 amps, 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy, 937-V.
Drive—Belt.
Regulation—Step voltage control.
Thermostat—None.
Output, cold—18 amps, 8.3 volts, 2000 r.p.m.
Output, hot—15 amps., 8.0 volts, 2400 r.p.m.
Brush Spring Tension—23-27 oz.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.4-6.8 volts.
Amps. Discharge to Open—0-3.
Field Fuse—6 amps.

IGNITION

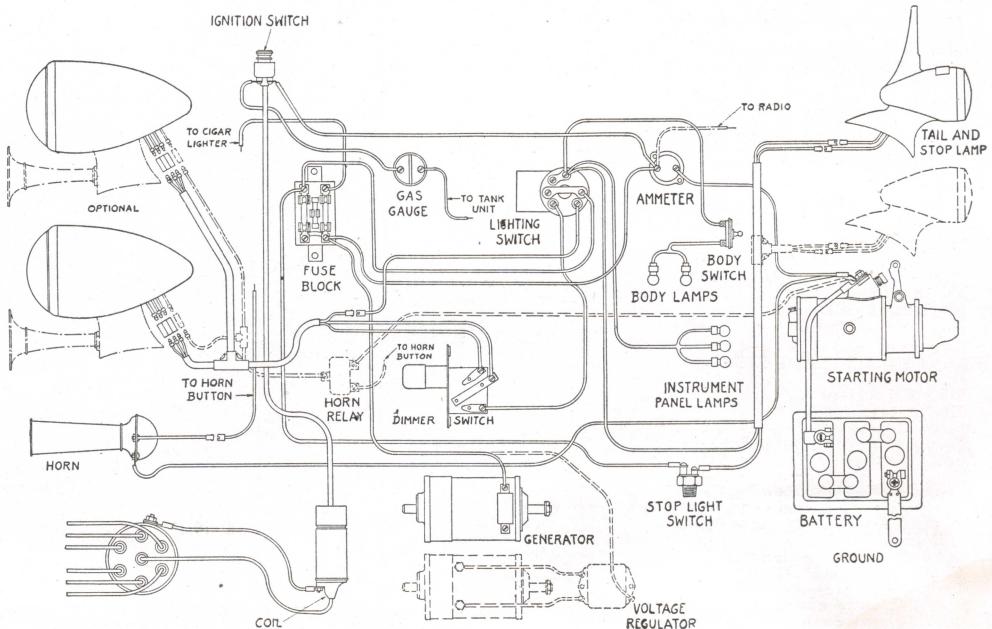
Distributor—Delco-Remy 623-A.
Coil—Delco-Remy 536-J.
Distr. Rotation—Clockwise viewing drive end of distributor.
Breaker Gap—.018"—.024".
Brush Spr. Tension—17-21 oz.
Sp. Plug Gap—.025".
Sp. Plug Size—Champion, 18 m/m.
Manual Advance—None.
Automatic Adv.—18° engine at 2800 r.p.m.
Vacuum Advance 10°.
Timing—2 degrees before top center.
Coil Amps., Engine Idling—1.8.
Coil Amps., Engine Stopped—3.0.

BATTERY

Amps.—Willard 90 amp. hr.

LAMPS

Head—No. 2320 L.
Park—No. 55.
Instrument—No. 63.
Dome—No. 63.
Stop and Tail—No. 1158 L.



Hudson, 1938

MODEL 112

(Starting serial and engine No. 8928566)

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—21.6.
Displacement—175.0 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—83 at 4000 r.p.m.

CAMSHAFT

Drive—By gear.
Chain Data—Not given.
Valve Timing—Marks on gears opposite each other.
Bearings—3.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0025".

CONNECTING RODS

End Clearance—.006"- .010".
Dia. Clearance—.001".

COOLING SYSTEM

Capacity—12 qts.
Pump Drive—V-belt.
Belt Size—Not given.
Belt Adjustment—Generator mounting.
Pump Pack Adjustment—Automatic.

CRANKSHAFT

No. Bearings—3, bronze-backed babbitt.
Material—Not given.
End Thrust Taken On—Center bearing.
End Clearance—.006"- .012".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Downdraft single.
Adjustment—Idle, $\frac{1}{4}$ to 1 turn open.
Main jet fixed size.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Hudson Duo-Flo automatic.
Pump Type—Oscillating plunger.
Capacity—Total $5\frac{1}{2}$ qts.; reservoir only $4\frac{1}{2}$ qts.
Oil Pressure—Not given.
Adjustment—Not given.
Oil $\left\{ \begin{array}{l} 50^{\circ}\text{F. to } 110^{\circ}\text{F. } \dots \text{S.A.E. 30.} \\ 10^{\circ}\text{F. to } 80^{\circ}\text{F. } \dots \text{S.A.E. 20W.} \\ -10^{\circ}\text{F. to } 40^{\circ}\text{F. } \dots \text{S.A.E. 10W.} \\ -30^{\circ}\text{F. to } +20^{\circ}\text{F. } \dots \text{S.A.E. 10W.} \end{array} \right.$
+ 10% kerosene.

PISTONS

Material—Lo-Ex alloy, cam-ground.
Clearance—Top—.016".
Clearance—Bottom—.002".

PISTON RINGS

Gap—All rings .005".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2 (one above, one below piston pin).
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0003" at 200° Fahr.
Fit in Rod—.0003".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{8}$ ".
Dia. Intake— $1\frac{1}{8}$ ".
Stem Dia.— $1\frac{1}{32}$ ".
Seat Angle— 45° .
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.006".
Exhaust—.008".
Guides Removable—Yes.
Spring Pressure—44 lbs. at 2".
102 lbs. at $1\frac{1}{2}$ sec.

CHASSIS

FRONT AXLE
Caster— $2^{\circ}-2\frac{1}{2}^{\circ}$ (max. variation right to left $\frac{1}{2}^{\circ}$).
Camber— $1^{\circ}-1\frac{1}{2}^{\circ}$.
Toe-in—At felloe 10" from ground, $0^{\circ}-\frac{1}{8}^{\circ}$.
Kingpin Angle— 7° .
Tie Rod Adj.—Thread.

REAR AXLE
Type—Semi-floating.
Pinion Bearing Type—Taper roller.
Adjustment—Shim.
End Play—.000"-.001".
Lash—.0005"-.003" (adjustment by shims).
Diff. Bearing Type—Taper roller.
Adjustment—Screw.
End Play—.009" tension.
Lubricant Capacity—Housing— $2\frac{3}{4}$ pts, Summer and Winter, S.A.E. 90 E. P.

TRANSMISSION
Make and Type—3-speed, helical gear.
Main Shaft Bearing Type and No.—Ball and roller.
Countershaft Bearing Type and No.—Steel-backed babbitt.

BRAKES
Type—Hydraulic (Bendix).
Lining Type—Moulded and woven.
Lining Size— $19^{\prime\prime} \times 1\frac{3}{8}^{\prime\prime} \times \frac{3}{16}^{\prime\prime}$.
Adjustments—Eccentric for each shoe.
Adjusting screw for clearance.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—Not given.

CLUTCH
Type—Single disc in oil.
Facing Type—Cork.
Pilot Bearing Type and No.—Ball.
Throwout Bearing Type and No.—Ball.

SPRINGS
Type Front—Semi-elliptic.
Type Rear—Semielliptic.
Shackle Adjustment—Self-adjusting.

STEERING GEAR
Type—Worm and roller.
Adjustments—Wormshaft—shims.
Cross-shaft—screw gear mesh—adjusting screw.
Lubricant—Summer and Winter, S.A.E. 90 E. P.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—Not given.
Lock Torque—12 ft. lbs., 3.0 volts, 550 amps
Brush Spring Tension—Not given.

GENERATOR

Make—Auto-Lite.
Drive—V-belt.
Regulation—Third brush (voltage regulation on cars with radio and optional generator).
Thermostat—None.
Output, cold—21 amps. max., 19 amps. min.
With high output generator, 32 amps. max., 29 amps. min.
Output, hot—19 amps. max., 17 amps. min.
With high output generator, 29 amps. max., 26 amps. min.
Brush Spring Tension—23-27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5 to 7.4 volts.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020" max.
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.032".
Sp. Plug Size—Champion type 18, 14 m/m.
Manual Advance—None.
Automatic Advance—Yes.
Timing— $\frac{1}{4}$ " before top dead center.
Coil Amps., Engine Idling—2.5 amps.
Coil Amps., Engine Stopped—4.5 amps.

BATTERY

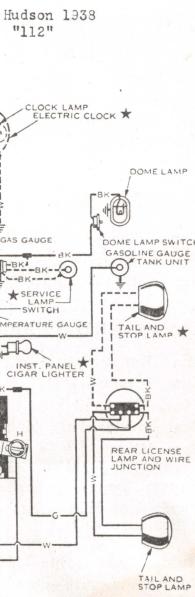
Amps.—17-plate.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps (2 on fuse block).
Dome—No. 87.
Stop and Tail—No. 1158.
License—No. 63.
Dash Signals—No. 51.
Fender Lamp—No. 63.

Circuit	No. Used	Capacity
LIGHTING	1	20 AMP
ACCESSORY	1	20 AMP

INDICATING WIRE CONNECTOR
★ SERVICE ITEMS ONLY



Hudson 6, 1938

MODEL 83

ENGINE

DATA

No. of Cylinders—6.
Bore—3".
Stroke—5".
Taxable H. P.—21.6.
Displacement—212.0 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—101 at 4000 r.p.m.

CAMSHAFT

Drive—Gears.
Chain Data—Not given.
Valve Timing—Gear marks in mesh.
Bearings—3.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0015".

CONNECTING RODS

End Clearance—.006"—.010".
Dia. Clearance—.0003"—.0006".

COOLING SYSTEM

Capacity—12½ qts.
Pump Drive—Fan belt.
Belt Size—42" V, 44¾" x .781".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze-backed babbitt.
End Thrust Taken On—Center bearing.
End Clearance—.006"—.012".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Carter "WDO"—402S.
Type—Dual downdraft.
Adjustment—Idle, ¼-¾ turn open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Splash.
Pump Type—Oscillating plunger.
Capacity—Refill 5 qts., dry 6 qts.
Oil Pressure—3 lbs. normal.
Adjustment—Non-adjustable.
—30°—+20°F..... S.A.E. 10W., plus
10% kerosene.
Oil —10°—+40°F..... S.A.E. 10W.
+10°—+80°F..... S.A.E. 20W.
Above 50°F..... S.A.E. No. 30.

PISTONS

Material—Lo-Ex. alum. alloy, cam-ground.
Clearance—Top—.016".
Clearance—Bottom—.0005"—.001".

PISTON RINGS

Gap—All rings .009"—.011".
No. Comp. Rings—2.
Width—.093".
No. Oil Rings—2 (one below piston pin).
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Selective fit to .0003".
Fit in Rod—Selective fit to .0003".

VALVES AND TAPPETS

Dia. Exhaust—1¾".
Dia. Intake—1¾".
Stem Dia.—.343".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.006".
Exhaust—.008".
Guides Removable—Yes.
Spring Pressure—44 lbs. at 2".
102 lbs. at 1,656".
Free length, 2.26" approx.

CHASSIS

FRONT AXLE

Caster—2°-3°.
Camber—1°-1½°.
Toe-in—0"- $\frac{1}{8}$ ".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Timken No. 3199-3120.
Adjustment—Shims.
End Play—.000"—.001".
Lash—.0005"—.0035".
Diff. Bearing Type—Bower No. 28155-28300.
Adjustment—Thread.
End Play—.009" tension.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own, 3-speed.
Main Shaft Bearing Type and No.—Radial
No. 205.
Countershaft Bearing Type and No.—Bush-
ing.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size—22½" x 1¾" x .218".
Adjustments—Eccentric for centralizing.
Notched wheel for clearance.
Sliding type anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Own, wet disc type.
Facing Type—Cork.
Pilot Bearing Type and No.—Radial No.
200.
Throwout Bearing Type and No.—Special.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent "U," threaded.

STEERING GEAR

Type—Gemmer worm and roller tooth.
Adjustments
Column end play—shims bottom cover.
Cross-shaft end play—adjusting screw.
Mesh—through cross-shaft adjusting screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAB 4075.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque—22½ ft. lbs., 780 amps., 4.0
volts.
Brush Spring Tension—46.53 oz., when new.

GENERATOR

Make—Auto-Lite—GDF 4802A.
Drive—Fan belt.
Regulation—Voltage regulator.
Thermostat—None.
Output, cold—30.8 amps., 8 volts, 3100 r.p.m.
Output, hot—28.2 amps., 8 volts, 3200 r.p.m.
Brush Spring Tension—23.27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5 to 7.25 volts at 8.4
m.p.h.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

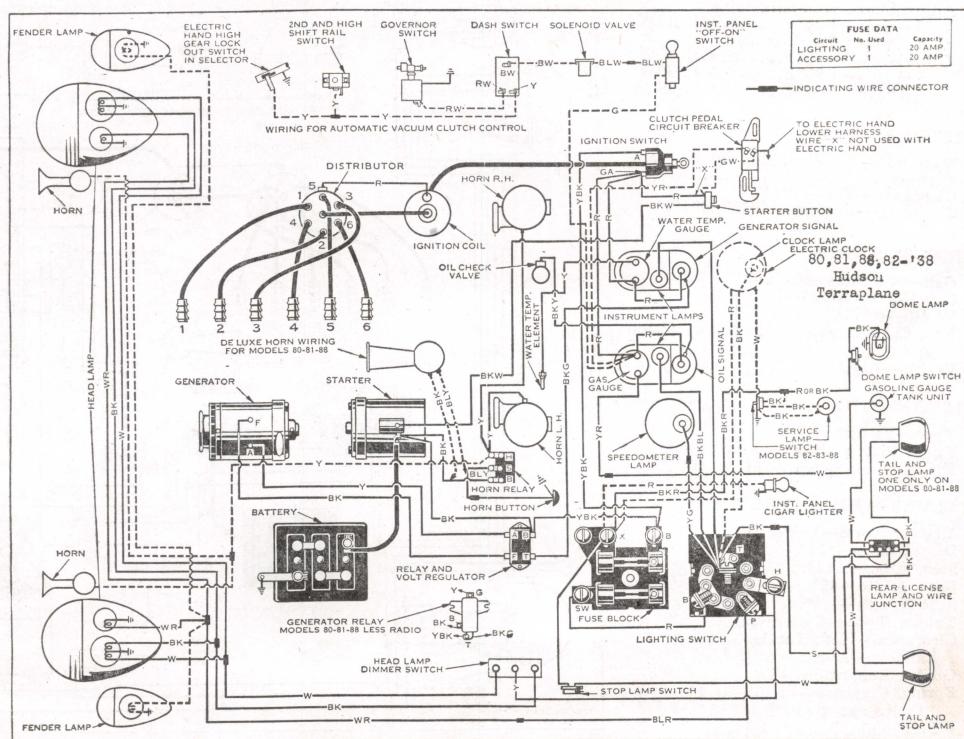
Distributor—Auto-Lite—IGW—4103A.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spring Tension—18.20 oz.
Spark Plug Gap—.032".
Sp. Plug Size—14 m/m Champion "J-8-A."
Manual Advance—None.
Automatic Advance—28° engine.
Timing—Top dead center.
Coil Amps., Engine Idling—2.5 amps.
Coil Amps., Engine Stopped—4.5 amps.

BATTERY

Amps.—.96 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.



Hudson Terraplane, 1938

MODELS 80, 81, 82 and 88

NOTE: Data applies to all models, unless otherwise mentioned

ENGINE

DATA

No. of Cylinders—6.
Bore—3".
Stroke—5".
Taxable H. P.—21.6.
Displacement—212.0 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—96 at 3900 r.p.m.
"82"—101 at 4000 r.p.m.

CAMSHAFT

Drive—Gears.
Chain Data—Not given.
Valve Timing—Gear marks opposite each other.
Bearings—3.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0015".

CONNECTING RODS

End Clearance—.006"- .010".
Dia. Clearance—.0003"- .0006".

COOLING SYSTEM

Capacity—12½ qts.
Pump Drive—Fan belt.
Belt Size—42° V, 44⅝" x .781".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze, babbitt-lined.
End Thrust Taken On—Center bearing.
End Clearance—.006"- .012".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Carter "W-1" 397S.
"82"—Carter "WDO"—402S, dual down-draft.
Type—Downdraft single.
Adjustment—Idle, ¼-1 turn open.
"82"—Idle, ¼-¾ turn open.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Splash.
Pump Type—Oscillating plunger.
Capacity—4½ qts. refill, 6 qts. dry.
Oil Pressure—3 lbs. normal.
Adjustment—Non-adjustable.
 $\begin{cases} -30^\circ & +20^\circ \text{ F.} \\ -10^\circ & +40^\circ \text{ F.} \\ +10^\circ & +80^\circ \text{ F.} \\ \text{Above} & +50^\circ \text{ F.} \end{cases}$ S.A.E. 10W.
plus 10% kerosene.
S.A.E. 10W.
S.A.E. 20W.
S.A.E. 30.

PISTONS

Material—Lo-Ex alum. alloy, cam-ground.
Clearance—Top—.016".
Clearance—Bottom—.0005"- .001".

PISTON RINGS

Gap—All rings .009"- .011".
No. Comp. Rings—2.
Width—.0933".
No. Oil Rings—2 (1 below piston pin).
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Selective fit to .0003".
Fit in Rod—Selective fit to .0003".

VALVES AND TAPPETS

Dia. Exhaust—1 $\frac{1}{8}$ ".
Dia. Intake—1 $\frac{1}{8}$ ".
Stem Dia.—.343".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.006".
Exhaust—.008".
Guides Removable—Yes.
Spring Pressure—44 lbs. at 2".
102 lbs. at 1656".
Free length, 2.26" approx.

CHASSIS

FRONT AXLE

Caster—2°-3°.
Camber—1°-1 $\frac{1}{2}$ °.
Toe-in—0°- $\frac{1}{8}$ ".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Timken No. 3199-3120.
Adjustment—Shims.
End Play—.0007"- .001".
Lash—.0005"- .0035".
Diff. Bearing Type—Bower No. 28155-28300.
Adjustment—Thread.
End Play—.009" tension.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own, 3-speed.
Main Shaft Bearing Type and No.—Radial No. 205.
Countershaft Bearing Type and No.—Bushings.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size—22 $\frac{1}{8}$ " x 1 $\frac{3}{4}$ " x .218".
Adjustments—Eccentric for centralizing.
Sliding type anchor.
Notched wheel for clearance.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

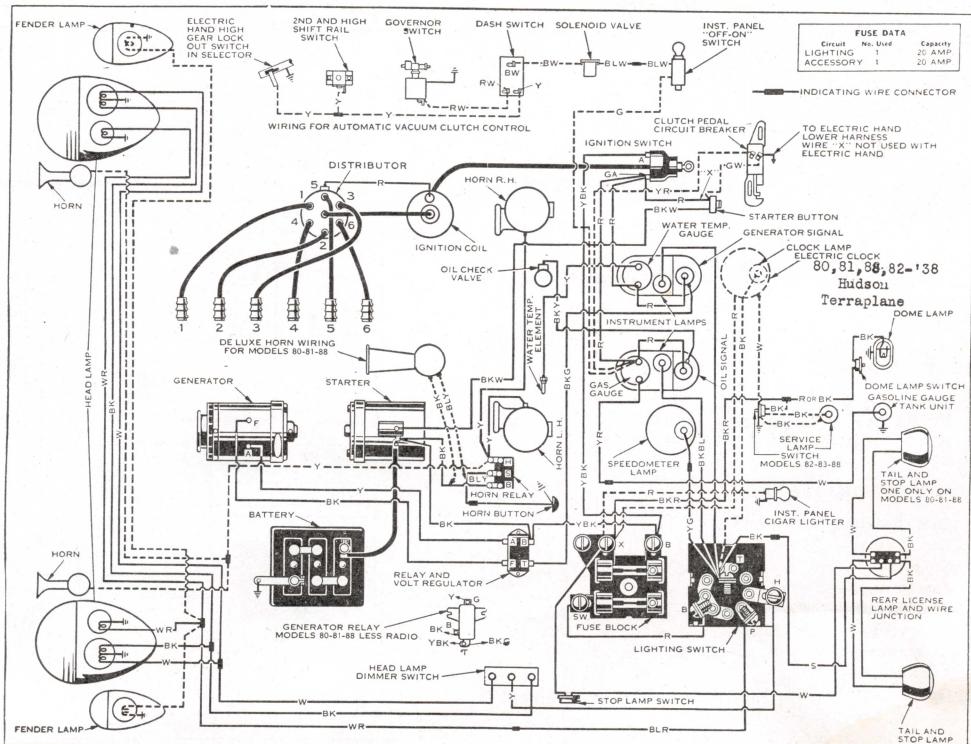
Type—Own, int. type disc.
Facing Type—Cork.
Pilot Bearing Type and No.—Radial No. 200.
Throwout Bearing Type and No.—Special.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent "U," threaded.

STEERING GEAR

Type—Gemmer worm and roller tooth.
Adjustments
Column end play—shim bottom cover
Cross-shaft end play—adjusting screw mesh
through cross-shaft adjusting screw.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAB 4075.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No. Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque—22½ ft. lbs., 780 amps., 4.0 volts.
Brush Spring Tension—46-53 oz. when new.

GENERATOR

Make—Auto-Lite—
m/80-81—GDF—4803A-1 without radio.
m/80-81—GDF—4802A with radio.
"82"—Auto-Lite—GDF 4802-A.
Drive—Belt.
Regulation—3rd brush; voltage regulator with radio.
Thermostat—None.
Output, cold—18 amps., 8 volts, 2800 r.p.m.
"82"—30.8 amps., 8 volts, 3100 r.p.m.
Output, hot—17 amps., 8 volts, 2800 r.p.m.
"82"—28.2 amps., 8 volts, 3200 r.p.m.
Brush Spring Tension—23-27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5 to 7.25 volts at 8.4 m.p.h.
amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite—
IGW—4012A without radio.
IGW—4104A with radio.
"82"—Auto-Lite—IGW—4103A.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.032".
Spark Plug Size—14 m/m Champion "J-8-A."
Manual Advance—None.
Automatic Adv.—28° engine.
Timing—Top dead center.
Coil Amps., Engine Idling—2.5 amps.
Coil Amps., Engine Stopped—4.5 amps.

BATTERY

Amps—96 amp. hour.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.

FUSE DATA

Circuit No. Used
LIGHTING ACCESSORY 1
Capacity 20 AMP 20 AMP

Hudson Eight, 1938

MODELS 84, 85, and 87

ENGINE

DATA

No. of Cylinders—8.
Bore—3.000".
Stroke—4½".
Taxable H. P.—28.8.
Displacement—254.47 cu. in.
Firing Order—1-6-2-5-3-7-4.
Max. H. P.—122 at 4200 r.p.m.

CAMSHAFT

Drive—Gears.
Chain Data—Not given.
Valve Timing—Gear marks in mesh.
Bearings—5.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0015".

CONNECTING RODS

End Clearance—.006"—.010".
Dia. Clearance—.0003"—.0006".

COOLING SYSTEM

Capacity—17.2 qts.
Pump Drive—Belt.
Belt Size—42" V, 44¾" x .781".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Bronze-backed babbitt.
End Thrust Taken On—Center bearing.
End Clearance—.006"—.012".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Carter "WDO" 402S.
Type—Dual downdraft.
Adjustment—Idle, ¼-¾ turn open.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Splash.
Pump Type—Oscillating plunger.
Capacity—Refill 7 qts., dry 9 qts.
Oil Pressure—3 lbs. normal.
Adjustment—Non-adjustable.
 $\begin{cases} -30^\circ +20^\circ F \dots S.A.E. 10W \\ \text{plus } 10\% \text{ kerosene.} \end{cases}$
 $\begin{cases} -10^\circ +40^\circ F \dots S.A.E. 10W \\ +10^\circ +80^\circ F \dots S.A.E. 20W \\ \text{Above } +50^\circ F \dots S.A.E. 30 \end{cases}$

PISTONS

Material—Lo-Ex alum. alloy, cam-ground.
Clearance—Top—.016".
Clearance—Bottom—.0005"—.001".

PISTON RINGS

Gap—All rings .009"—.011".
No. Comp. Rings—2.
Width—.093".
No. Oil Rings—2 (one below piston pin).
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Selective fit to .0003".
Fit in Rod—Not specified.

VALVES AND TAPPETS

Dia. Exhaust—1¾".
Dia. Intake—1½".
Stem Dia.—.343".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.006".
Exhaust—.008".
Guides Removable—Yes.
Spring Pressure—44 lbs. at 2".
102 lbs. at 1.656".
Free length, 2.26" approx.

CHASSIS

FRONT AXLE

Caster—2° 3'.
Camber—1° 1½'.
Toe-in—0"-.1/8".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Timken No. 3199 and
No. 3120.
Adjustment—Shims.
End Play—.000"—.001".
Lash—.0005"—.0035".
Diff. Bearing Type—Bower 28155-28300.
Adjustment—Thread.
End Play—.000"—.001".
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own, 3-speed.
Main Shaft Bearing Type and No.—Radial
No. 205.
Countershaft Bearing Type and No.—Special.

BRAKES

Type—Bendix two-shoe hydraulic.
Lining Type—Moulded.
Lining Size—23½" x 1¾" x .218".
Adjustments—Eccentric for centralizing.
Notched wheel for clearance.
Sliding type anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

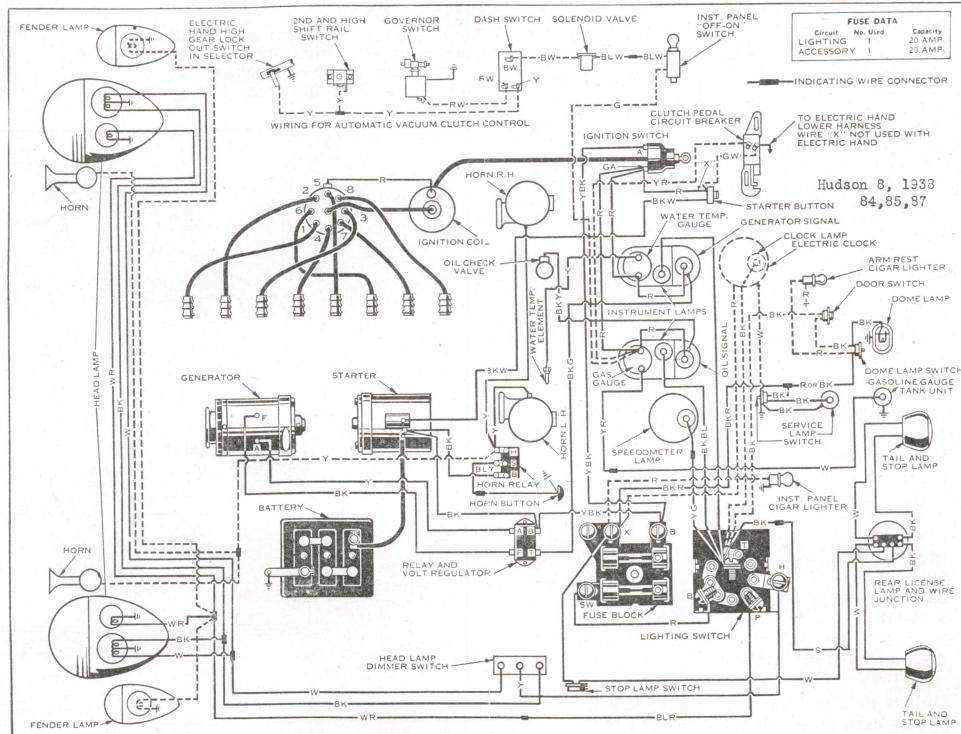
Type—Own, int. disc type.
Facing Type—Cork.
Pilot Bearing Type and No.—Radial No. 200.
Throwout Bearing Type and No.—Special.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent "U," threaded.

STEERING GEAR

Type—Gemmer worm and roller tooth.
Adjustments
Column end play—shims under lower cover.
Cross-shaft end play—adjusting screw mesh
—cross-shaft adjusting screw.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite, MAB—4075.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque—22½ ft. lbs., 780 amps., 4.0
volts.
Brush Spring Tension—46-53 oz., new
brushes.

GENERATOR

Make—Auto-Lite, GDF—4802A.
Drive—Belt.
Regulation—Voltage regulator.
Thermostat—None.
Output, cold—30.8 amps., 8.0 volts., 3100
r.p.m.
Output, hot—28.2 amps., 8.0 volts., 3100
r.p.m.
Brush Spring Tension—23-27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5 to 7.25 volts at 8.4
m.p.h.
Amps. Discharge to Open—2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite, IGP—4008A.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.017".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.032".
Spark Plug Size—14 m/m Champion "J-8-A."
Manual Advance—None.
Automatic Advance—35° engine.
Timing—Top dead center.
Coil Amps., Engine Idling—2.5 amps.
Coil Amps., Engine Stopped—4.5 amps.

BATTERY

Amps.—108 amp. hour.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.

Hudson Six

MODEL 73, 1937

ENGINE

DATA

No. of Cylinders—6.
Bore—3".
Stroke—5".
Taxable HP.—21.6.
Displacement—212 cu. in.
Firing Order—1-5-3-6-2-4.
Max HP.—101 @ 4000. Super power dome head 107 @ 4000.

CAMSHAFT

Drive—Gears.
Chain Data—
Valve Timing—Punch marks opposite each other.
Bearings—3.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0015".

CONNECTING RODS

End Clearance—.006"—.010".
Dia. Clearance—.001".

COOLING SYSTEM

Capacity—20 qts.
Pump Drive—V-belt.
Belt Size—42" V—44 $\frac{1}{2}$ " x .781".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze back, babbitt lined.
End Thrust Taken On—Center bearing.
End Clearance—.006"—.012".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Dual down draft.
Fuel Delivery—Camshaft pump.
Adjustment—Idle only; $\frac{1}{4}$ — $\frac{3}{4}$ turn open.

LUBRICATION

Type—Splash.
Pump Type—Oscillating plunger.
Capacity—5 qts.
Oil Pressure—Normal 3#.
Adjustment—None.
Oil—Above 50°F—S.A.E. #30; 10° to 80°F—
—S.A.E. 20W; -10° to +40°F—S.A.E.
10W; -30° to +20°F—S.A.E. 10W + 10%
kerosene.

PISTONS

Material—Lo-Ex alum. alloy cam ground.
T-slot.
Clearance—Top—.016".
Clearance—Bottom—.002".

PISTON RINGS

Gap—.009"—.011".
No. Comp. Rings—2.
Width—.093".
No. Oil Rings—2.
Width—.187" above pin, .187" below pin.

PISTON PINS

Type—Floating.
Fit in Piston—.0003" at 200°F.
Fit in Rod—.0003".

VALVES AND TAPPETS

Dia. Exhaust—1.375".
Dia. Intake—1.375".
Stem Dia.—.375".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Roll cam design.
Clearance—Hot: Intake—.008".
Exhaust—.010".

Guides Removable—Yes.

Spring Pressure—44# @ 2"; 102# @ 1.656".

CHASSIS

FRONT AXLE

Caster—1°-2°.
Camber—1°-1 $\frac{1}{2}$ °.
Toe-in—0"- $\frac{1}{8}$ ".
Kingpin Angle—7°.
Tie Rod Adj.—

REAR AXLE

Type—Own semi-floating, spiral bevel.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—.000"—.001".
Lash—.0005"—.0035".
Diff. Bearing Type—Bower.
Adjustment—Screw.
End Play—.009" tension.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own with electric hand.
Main Shaft Bearing Type and No.—#205 Radial.
Countershaft Bearing Type and No.—Steel backed babbitt.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size—22 $\frac{1}{8}$ " x 1 $\frac{3}{4}$ " x .218".
Adjustments—Eccentric for centralizing, adjusting screw for clearance, adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Own single plate.
Pilot Bearing Type and No.—#200 Radial.
Facing Type—Cork.
Throwout Bearing Type and No.—Special ball.

SPRINGS

Type Front—Semi-elliptic with safety control arms.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Gemmer Worm and Roller.
Adjustments—Column—shims. Cross shaft—set screw. Mesh—set screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite MAB 4075.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—60 amps., 5.5 volts @ 2250 RPM.
Lock Torque—22.5 ft. lbs. 780 amps., 4.0 volts.
Brush Spring Tension—46 to 53 oz.

GENERATOR

Make—Auto-Lite GC-J-4803-A.
Drive—Fan Belt.
Regulation—Voltage regulator.
Thermostat—
Output, cold—25 amps., 8 volts, 2500 RPM.
Output, hot—21.7 amps., 8 volts, 2700 RPM, 29.5 MPH.
Brush Spr. Tension—23 to 27 oz.
Rotation—Clockwise viewing drive end.
Cutout to close—6.5 to 7.25 volts.
Amps. Discharge to Open—0.5 to 2.5 at 6.5 volts.
Field Fuse—None.

IGNITION

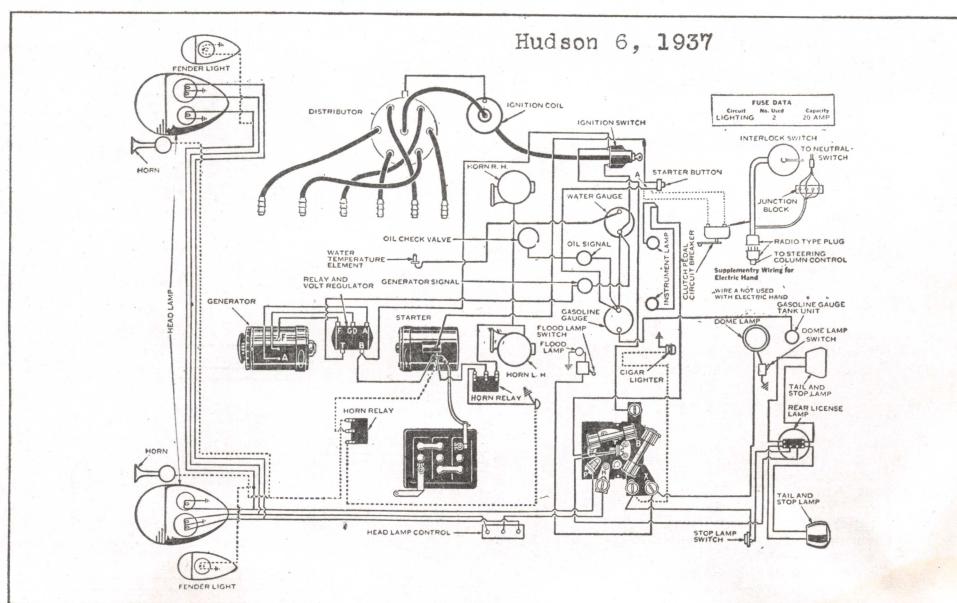
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spr. Tension—18-20 oz.
Sp. Plug Gap—.025".
Sp. Plug Size—Champion "J-8" 14 m/m.
Super power dome head "H-10".
Manual Advance—None.
Automatic Adv.—28° engine.
Timing—Top dead center.
Coil Amps., Engine Idling—2.5.
Coil Amps., Engine Stopped—4.5.

BATTERY

Amps.—105 amp. hr., located left side under hood.

LAMPS

Head—#2331.
Park—55.
Instrument—55.
Fuse—20 amps.
Dome—87.
Stop and Tail—1158.



Hudson Eight

MODELS 74, 75, 76 and 77

ENGINE

DATA

No. of Cylinders—8.
Bore—3".
Stroke—4½".
Taxable HP.—28.8.
Displacement—254.0 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. HP.—122 at 4200 r.p.m.

CAMSHAFT

Drive—Gears.
Chain Data—
Valve Timing—Marked gear teeth in mesh.
Bearings—5.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0015".

CONNECTING RODS

End Clearance—.006"- .010".
Dia. Clearance—.001".

COOLING SYSTEM

Capacity—20 qts.
Pump Drive—V-belt.
Belt Size—42" V, 44¾" wide, .781" long.
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Bronze back, babbitt.
End Thrust Taken On—Center bearing.
End Clearance—.006"- .012".
Dia. Clearance—.001".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Dual Downdraft.
Adjustment—Idle only; ¼ to ¾ turns open.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Splash.
Pump Type—Oscillating plunger.
Capacity—7 qts.
Oil Pressure—Normal 3 lbs.
Adjustment—None.
Winter Oil—
Summer Oil—
Same six cylinder—

PISTONS

Material—Lo-Ex alum. alloy cam ground.
T-slot.
Clearance—Top .016".
Clearance—Bottom .002".

PISTON RINGS

Gap—.009"- .011".
No. Comp. Rings—2.
Width—.093".
No. Oil Rings—2.
Width—.187", one above and one below pin.

PISTON PINS

Type—Floating.
Fit in Piston—.0003" at 200°F.
Fit in Rod—.0003".

VALVES AND TAPPETS

Dia. Exhaust—1¾".
Dia. Intake—1½".
Stem Dia.—.3715".
Seat Angle—45°.
Seat Width—1/8".
Tappet Type—Roll cam design.
Clearance—Hot: Intake—.008".
Exhaust—.010".
Guides Removable—Yes.
Spring Pressure—44# @ 2", 102# @ 1.656".

CHASSIS

FRONT AXLE

Caster—1°-2°.
Camber—1°-1½°.
Toe-in—0"-1/8".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—.000"- .001".
Lash—.0005"- .0035".
Diff. Bearing Type—Bower.
Adjustment—Screw.
End Play—.009" tension.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own with electric hand.
Main Shaft Bearing Type and No.—#205 Radial.
Countershaft Bearing Type and No.—Steel backed babbitt.

BRAKES

Type—Bendix Hydraulic.
Lining Type—Moulded.
Lining Size—23 1/8" x 1 3/4" x 218".
Adjustments—Eccentric for centralizing.
Adjusting Screw for clearance. Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Own single plate.
Facing Type—Cork.
Pilot Bearing Type and No.—#200 Radial.
Throwout Bearing Type and No.—Special Ball.

SPRINGS

Type Front—Semi-elliptic with safety control.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Gemmer worm and roller.
Adjustments—Column—shims. Cross shaft—set screw. Mesh—set screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite MAB 4075.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—60 amps., 5.5 volts, 2250 RPM.
Lock Torque—22½ ft. lbs., 780 amps., 40 volts.
Brush Spring Tension—46 to 53 oz.

GENERATOR

Make—Auto-Lite GCJ-4803A.
Drive—Belt.
Regulation—Voltage regulator.
Thermostat—150°-155° opening; 185° fully open.
Output, cold—25 amps., 8 volts, 2500 RPM.
Output, hot—21.7 amps., 8 volts, 2700 RPM, 29.5 MPH.
Brush Spr. Tension—23 to 27 oz.
Rotation—Clockwise viewing drive end.
Cutout to close—6.5 to 7.25 volts.
Amps. Discharge to Open—0.5 to 2.5 at 6.5 volts.
Field Fuse—None.

IGNITION

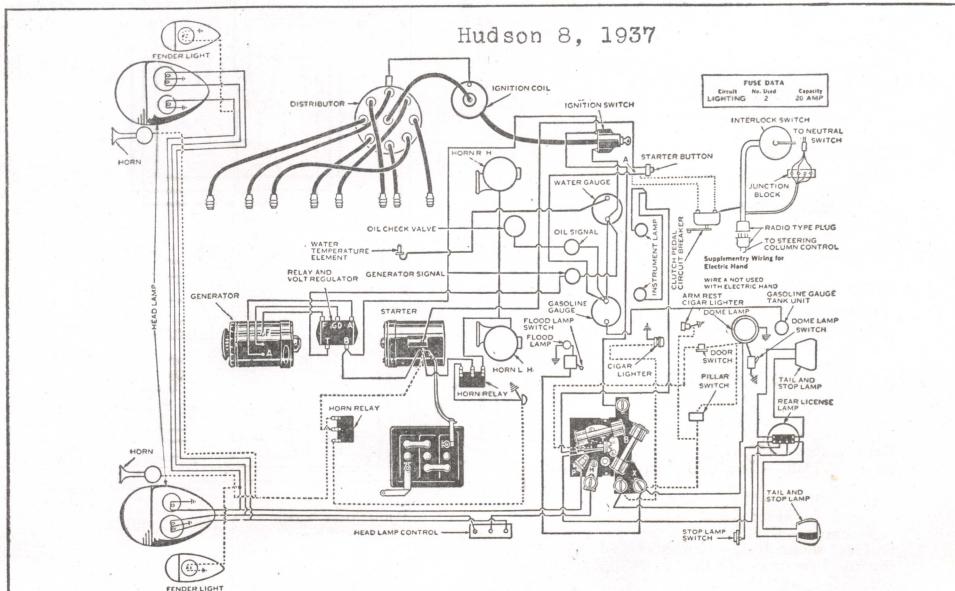
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spr. Tension—18 to 20 oz.
Sp. Plug Gap—.025".
Sp. Plug Size—Champion "J8"—14 m/m.
Manual Advance—None.
Automatic Adv.—35° engine.
Timing—Top dead center.
Coil Amps., Engine Idling—25.
Coil Amps., Engine Stopped—45.

BATTERY

Amps.—125 amp. hrs., located left side under hood.

LAMPS

Head—#2331.
Park—55.
Instrument—55.
Fuse—20 amps.
Dome—87.
Stop and Tail—1158.



Wiring Diagram

Hupmobile 6, 1938

SERIES E-622

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—29.42.
Displacement—245.3 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—101 at 3600 r.p.m.

CAMSHAFT

Drive—Morse chain.
Chain Data—51 links, 1" wide, $\frac{1}{8}$ " pitch.
Valve Timing—Marks on sprockets opposite each other on line through shaft centers.
No slack in chain.
Bearings—Not given.
End Thrust Taken On—Thrust plunger, front end.
Bearing Clearance—.002".

CONNECTING RODS

End Clearance—.005"—.010".
Dia. Clearance—.001"—.0025".

COOLING SYSTEM

Capacity—18 qts.
Pump Drive—Belt.
Belt Size— $42^{\prime\prime}$ V— $42^{\prime\prime}$ x $1\frac{1}{16}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt, steel-backed.
End Thrust Taken On—No. 2 bearing.
End Clearance—.004"—.008".
Dia. Clearance—.001"—.003".

FUEL SYSTEM

Carburetor Make—Carter "W-I"—398S.
Type—Single downdraft.
Adjustment—Idle only, $\frac{3}{4}$ - $1\frac{1}{4}$ turns open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity— $6\frac{1}{2}$ qts.
Oil Pressure—30 lbs. at 30 m.p.h. (3 to 5 lbs. idling).
Adjustment—Not given.
Oil—
Summer—High speed above 90° F.S.A.E. No. 40
45°—90° F.S.A.E. No. 30
Moderate Winter—0°—45° F.S.A.E. No. 20
Extreme Winter—Below 0°F. F.S.A.E. No. 10W.

PISTONS

Material—Bohn alum., Invar strut.
Clearance—Top—.0205"—.026".
Clearance—Bottom—.002"—.0025" with 8 lbs. pull on thickness gauge.

PISTON RINGS

Gap—Comp., .007"—.012"; Oil, .007"—.015".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0005".
Fit in Rod—.0005".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{2}\frac{1}{2}$ ".
Dia. Intake— $1\frac{1}{2}\frac{1}{2}$ ".
Stem Dia.—.341".
Seat Angle—45°.
Seat Width—Int., $\frac{1}{16}$ "— $\frac{5}{64}$ "; Ex., $\frac{3}{32}$ "— $\frac{7}{64}$ ".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.010".
Exhaust—.013".
Guides Removable—Not specified.
Spring Pressure—40 lbs. at $11\frac{3}{16}$ ".
100 lbs. at $11\frac{3}{16}$ ".
 $2\frac{3}{4}$ " free length.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ °.
Camber— 1° .
Toe-in— $\frac{1}{16}$ "— $\frac{3}{16}$ ".
Kingpin Angle— $7\frac{1}{2}$ °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Spicer Model 42, semi-floating, spiral bevel.
Pinion Bearing Type—Timken 02872-02820 and 31593 and 31520.
Adjustment—Shims.
End Play—Not specified.
Lash—.004"—.007".
Diff. Bearing Type—Timken No. 25577 and 25523.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{3}{4}$ pts.

TRANSMISSION

Make and Type—Three-speed, Warner gear, "TS6".
Main Shaft Bearing Type and No.—M.R.C. 207 SFG and 305 SFG.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Lockheed hydraulic, two-shoe.
Lining Type—Moulded.
Lining Size— $20\frac{3}{4}$ " x 2" x $\frac{3}{16}$ ".
Adjustments—Cam for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.005".
Brake Effort—55% front, 45% rear.

CLUTCH

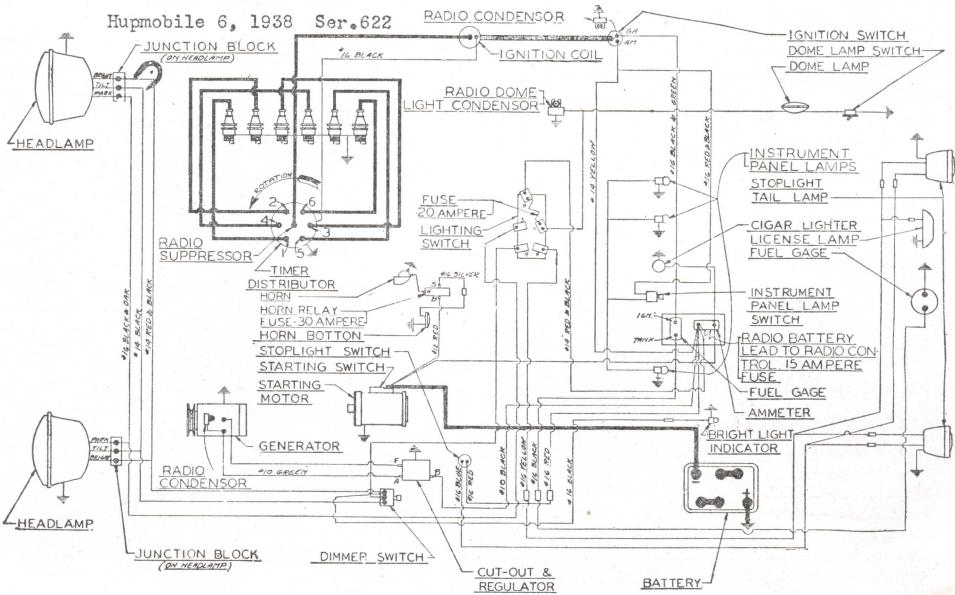
Type—B. & B., single plate.
Facing Type—One moulded and one woven.
Pilot Bearing Type and No.—Roller, $\frac{5}{8}$ " I.D. x $1\frac{1}{8}$ " O.D. x 1".
Throwout Bearing Type and No.—Aetna Ball No. A899.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded "U."

STEERING GEAR

Type—Gemmer worm and double roller.
Adjustments—Column end play—shims.
Cross-shaft end play—adjusting screw.
Mesh—adjusting screw.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAJ 4040.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—67 amps., 5.5 volts, 4100 r.p.m.
Lock Torque—17 ft. lbs., 750 amps., 4.0 volts.
Brush Spring Tension—42.53 oz., new brushes.

GENERATOR

Make—Auto-Lite—GDF 4804A.
Drive—Belt.
Regulation—Voltage regulator.
Thermostat—None.
Output, cold—30 amps., 8.0 volts, 3200 r.p.m.
Output, hot—28 amps., 8.0 volts, 3200 r.p.m., 34 m.p.h.
Brush Spring Tension—Max., 53 oz., new brushes.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 volts at 9 1/2 m.p.h.
Amps. Discharge to Open—0.20 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite—IGC 4277.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.022".
Brush Spring Tension—16.20 oz.
Spark Plug Gap—.026"—.030".
Spark Plug Size—18 m/m, Champion No. 7.
Manual Advance—None.
Automatic Advance—14° engine; full advance or .022" piston travel before top dead center.
Timing—7° before top dead center.
Coil Amps., Engine Idling—2.0 amps.
Coil Amps., Engine Stopped—5.0 amps.

BATTERY

Amps.—105 amp. hr.

LAMPS

Head—No. 2320.
Park—No. 63.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 81.
Stop and Tail—No. 1158.

Hupmobile 8, 1938

SERIES H

ENGINE

CHASSIS

ELECTRICAL DATA

DATA

No. of Cylinders—8.
Bore— $3\frac{3}{16}$ ".
Stroke— $4\frac{3}{4}$ ".
Taxable H. P.—32.51.
Displacement—303.2 cu. in.
Firing Order—1-4-7-3-8-5-2-6.
Max. H. P.—120 at 3600 r.p.m.

CAMSHAFT

Drive—Morse chain.
Chain Data—66 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—15 links between sprocket
marks, No. 1 on top dead center.
Bearings—6.
End Thrust Taken On—Plunger front end.
Bearing Clearance—.002".

CONNECTING RODS

End Clearance—.005"- .010".
Dia. Clearance—.0015"- .0025".

COOLING SYSTEM

Capacity— $21\frac{1}{2}$ qts.
Pump Drive—Not given.
Belt Size—V— $46\frac{1}{2} \times 3\frac{1}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Not given.

CRANKSHAFT

No. Bearings—5.
Material—Babbitt, steel back.
End Thrust Taken On—Rear intermediate
bearing.
End Clearance—.004"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter "WDO."
Type—Dual downdraft.
Adjustment—Idle adjustment only, $\frac{1}{4}$ -1 turn
open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—8 qts.
Oil Pressure—30 lbs. at 30 m.p.h.
Adjustment—Thread.
Winter Oil—S.A.E. No. 20.
Summer Oil—S.A.E. No. 30.

PISTONS

Material—Bohn alum., steel strut.
Clearance—Top—Not given.
Clearance—Bottom—.002" with 6 to
8 lbs. pull on thickness gauge.

PISTON RINGS
Gap—Comp., .007"- .012"; Oil, .007"-
.015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0005".
Fit in Rod—.0005".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{8}\frac{1}{32}$ ".
Dia. Intake— $1\frac{7}{8}\frac{1}{32}$ ".
Stem Dia.—.341".
Seat Angle—45°.
Seat Width—Int., $\frac{1}{16}$ "-.564"; Ex.,
 $\frac{3}{32}$ "-.764".
Tappet Type—Lever and roller.
Clearance—Hot: Intake—.008".
Exhaust—.013".
Guides Removable—Yes.
Spring Pressure—40 lbs. at $11\frac{3}{16}$ ".
100 lbs. at $11\frac{5}{32}$ ".

FRONT AXLE

Caster— $1\frac{1}{2}$ °.
Camber— $1\frac{1}{4}$ °.
Toe-in— $\frac{1}{16}$ ".
Kingpin Angle— $8\frac{1}{2}$ °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lash—.003"- .008".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Warner gear.
Main Shaft Bearing Type and No.—MRC
208MFG and 209S.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size— $25\frac{1}{8}$ " x 2" x $\frac{3}{16}$ ".
Adjustments—Eccentric or cam for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.005".
Brake Effort—55% front, 45% rear.

CLUTCH

Type—Single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—Not given.
Throwout Bearing Type and No.—Not given.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded "U."

STEERING GEAR

Type—Gemmer worm and roller.
Adjustments—Column end play—shims.
Cross-shaft end play—adjusting screw.
Mesh—adjusting screw.
Lubricant—Steering gear lubricant.

STARTING MOTOR

Make—Auto-Lite—MAB 4095.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque— $21\frac{1}{2}$ ft. lbs., 4.0 volts, 750
amps.
Brush Spring Tension—42.53 oz., with new
brushes.

GENERATOR

Make—Auto-Lite—GDF 4804A.
Drive—Belt.
Regulation—Voltage regulator.
Thermostat—None.
Output, cold—32 amps., 8.0 volts, 3200
r.p.m.
Output, hot—28 amps., 8.0 volts, 3200 r.p.m.
or 33.9 m.p.m.
Brush Spring Tension—Max., 53 oz. with
new brushes.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 volts at 9.2 m.p.h.
Amps. Discharge to Open—0.2.0 amps.
Field Fuse—None.

IGNITION

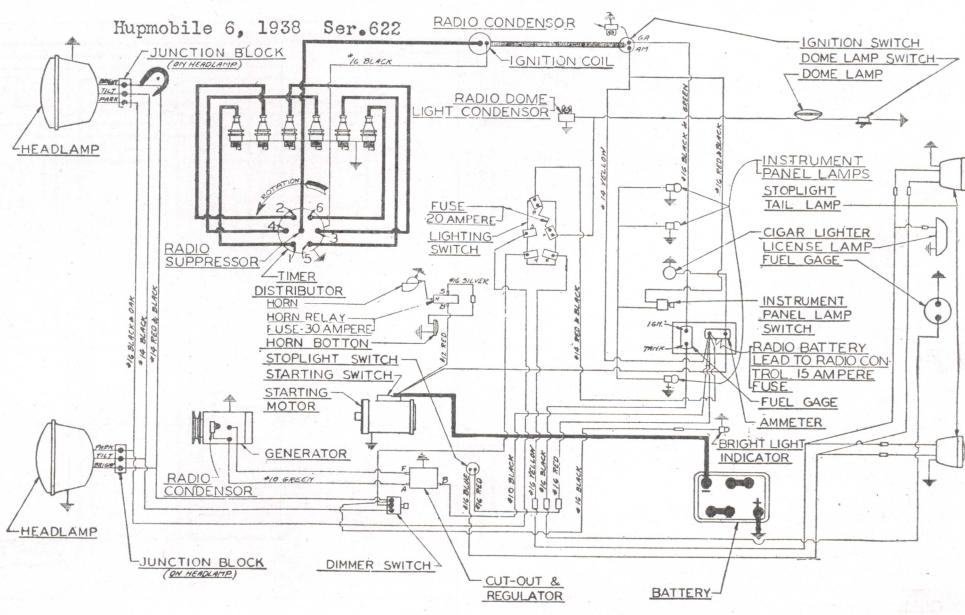
Distributor—Auto-Lite—IGT-4008.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.016".
Brush Spring Tension—18-23 oz.
Spark Plug Gap—.028".
Spark Plug Size—18 m/m Champion No. 7.
Manual Advance—None.
Automatic Advance—13°.
Vacuum Advance—16°.
Timing—7 degs. before top dead center.
Coil Amps., Engine Idling—2.0 amps.
Coil Amps., Engine Stopped—5.0 amps.

BATTERY

Amps.—120 amp. hr.

LAMPS

Head—No. 2320.
Park—No. 63.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 81.
Stop and Tail—No. 1158.



LaSalle, 1938

SERIES 38-50

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—36.45.
Displacement—322 cu. in.
Firing Order—1-8-7-3-6-5-4-2.
Max. H. P.—125 at 3400 r.p.m.

CAMSHAFT

Drive—Morse Type C, No. 3682R.
Chain Data—62 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Check to flywheel marking.
Bearings—4.
End Thrust Taken On—Front end.
Bearing clearance—.0025".-.0037".

CONNECTING RODS

End Clearance—.003".-.006".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $6\frac{1}{4}$ gals.
Pump Drive—Vee belt.
Belt Size—V— $1\frac{1}{4}$ " wide, $41\frac{3}{4}$ " long.
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze or steel-back babbitt.
End Thrust Taken On—Center bearing No. 2.
End Clearance—.001".-.005".
Dia. Clearance—.0015".

FUEL SYSTEM

Carburetor Make—Carter WDO—392S.
Type— $1\frac{1}{8}$ " downdraft dual.
Adjustment—Idle, $\frac{1}{4}$ to 1 turn open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Helical gear.
Capacity—7 qts.
Oil Pressure—25 lbs. at 30 m.p.h.
Adjustment—None.
Winter Oil— 0° - 32° 20W; below zero, 10W.
Summer Oil—30, moderate speeds; 40-50,
high speeds.

PISTONS

Material — Alum. alloy, T-slot, anodized
finish.
Clearance—Top, .023".
Clearance—Bottom — Top of skirt,
.0019".
Bottom of skirt, .0011".-.0015".

PISTON RINGS

Gap—Comp., .007".-.012"; oil, .007".
.015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0004" press at one
end; .0000" clearance other end.
Fit in Rod—.0002".-.0008".

VALVES AND TAPPETS

Dia. Exhaust—Not given.
Dia. Intake— $1.876^{\prime\prime}$ -. $1.886^{\prime\prime}$.
Stem Dia.—Int., .3415"—.3425"; Exh.,
.3405"—.3415".
Seat Angle— 45° .
Seat Width— $\frac{5}{64}$ ".
Tappet Type—Mushroom.
Clearance—Hot:
Intake—Automatic adjustment.
Exhaust—Automatic adjustment.
Guides Removable—Yes.
Spring Pressure—66 lbs. at 1.926".
145 lbs. at 1.581".

CHASSIS

FRONT AXLE

Caster— 34° -. 0° .
Camber— $\frac{1}{4}$ -. 1° .
Toe-in—in motion, 0° -. 16° ; at rest, $\frac{1}{32}^{\circ}$ -. $\frac{3}{32}^{\circ}$.
Kingpin Angle— 4° $51'$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Timken, 142250-
142251.
Adjustment—Shims.
End Play—Not given.
Lash—.004".-.008".
Diff. Bearing Type—Timken No. 1419355.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—5 pts.

TRANSMISSION

Make and Type—Own, 3-speed, helical gears.
Main Shaft Bearing Type and No.—N. D.
Ball 47508.
Countershaft Bearing Type and No.—Needle
bearing.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $25\frac{7}{8}$ " x $2\frac{1}{2}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Eccentric anchor pin.
Clearance—Top, .010".
Bottom, .010".
Brake Effort— $54\frac{1}{2}\%$ front, $45\frac{1}{2}\%$ rear.

CLUTCH

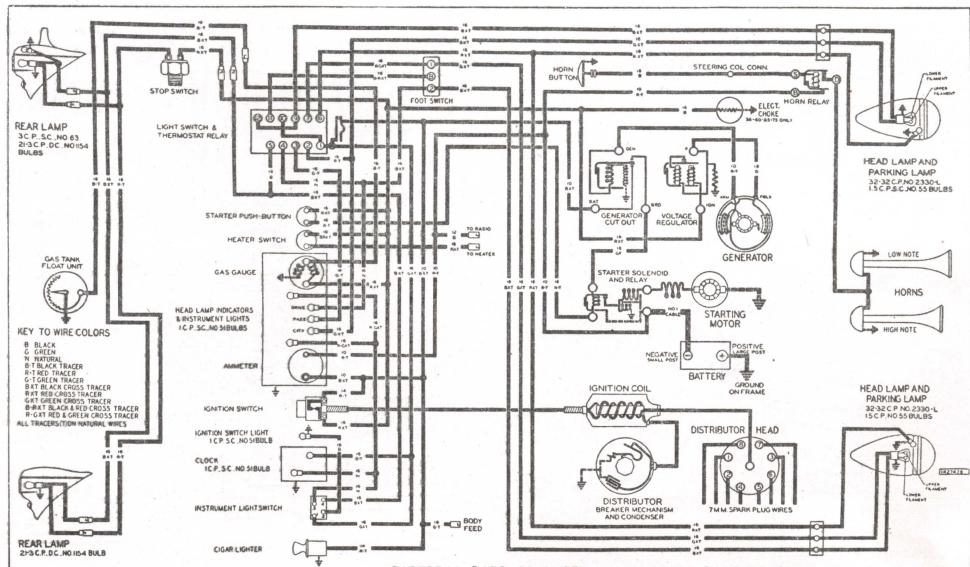
Type—Long, semi-centrifugal.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. Ball
7202.
Throwout Bearing Type and No.—Bearings
Co. C.T.D.S.—56.

SPRINGS

Type Front—Helical (coil).
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Saginaw worm and double-tooth roller.
Adjustments — Column end-play—adjusting
screw.
Cross-shaft—adjusting screw.
Mesh—eccentric.
Lubricant—Not given.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 727V.
Drive—Solenoid shifted gear.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts at 5500 r.p.m.
Lock Torque—16 ft. lbs., 600 amps., 3.0
volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy No. 1101051.
Drive—Belt V-type, $\frac{3}{4}$ " wide x $47\frac{1}{16}$ ".
Regulation—Voltage regulator.
Thermostat—None.
Output—28-30 amps. cold. Due to voltage
regulation actual charging rate is con-
trolled by state of battery charge.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5 to 7.0 volts.
Amps. Discharge to Open—0.3.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy No. 665-G.
Coil—Delco-Remy No. 539-C.
Distr. Rotation—Clockwise.
Breaker Gap—.0125".-.0175".
Brush Spring Tension—Not given.
Spark Plug Gap—.025".-.030".
Spark Plug Size—14 m/m, A. C. No. 45.
Manual Advance— 20° .
Automatic Advance— 22° .
Vacuum Advance—None.
Timing—5 degs. before top dead center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—Delco—110 amp. hour.

LAMPS

Head—No. 2330L.
Park—No. 55 in headlamps.
Instrument and Indicators—No. 51.
Fuse—Not given.
Dome—No. 81.
Stop and Tail—No. 1154 and No. 63.

LaSalle V-8, 1937

MODEL 37-50

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—36.45.
Displacement—322.0 cu. in.
Firing Order—1-8-7-3-6-5-4-2.
Max. H. P.—125 at 3400 r.p.m.

CAMSHAFT

Drive—Morse chain No. 3682-RX.
Chain Data—62 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Check to flywheel marking.
Bearings—4.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0025"--.0037".

CONNECTING RODS

End Clearance—.003"--.006".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $6\frac{1}{4}$ gals.
Pump Drive—Belt.
Belt Size— $34^{\circ}V$, $1\frac{1}{2}$ " x $1\frac{1}{4}$ ".
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—3.
Material—Bronze-backed babbitt.
End Thrust Taken On—Not given.
End Clearance—.001"--.005".
Dia. Clearance—.0015".

FUEL SYSTEM

Carburetor Make—Stromberg "AA-25."
Type—Downdraft dual.
Adjustment—Turn in for lean, out for rich mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—30 lbs. at 60 m.p.h.
Adjustment—None.
Oil { Summer—Moderate speeds, S.A.E. 30;
high speeds, S.A.E. 40-50.
Winter— 0° - 32° S.A.E. 20W; below zero, 10W.

PISTONS

Material—Lynite Lo-Ex. alum. alloy, anodized finish.
Clearance—Top—.023".
Clearance—Bottom—.0019".

PISTON RINGS

Gap—Comp., .007"-.012"; Oil, .007"-.015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in piston—.0004 press at one end, .0000" clearance at either end.
Fit in Rod—.0002"--.0008".

VALVES AND TAPPETS

Dia. Exhaust— $1.626^{\prime\prime}$ - $1.636^{\prime\prime}$.
Dia. Intake— $1.876^{\prime\prime}$ - $1.886^{\prime\prime}$
Stem Dia.—Int., .3415"--.3425";
Exh., .3405"--.3415".
Seat Angle— 45° .
Seat Width—Int., $\frac{1}{16}$ "; Exh. $\frac{5}{64}$ ".
Tappet Type—Mushroom.
Clearance—Hot: Intake—Automatic adjustment.
Exhaust—Automatic adjustment.
Guides Removable—Yes.
Spring Pressure—66 lbs. at 1.926".
145 lbs. at 1.581".

CHASSIS

FRONT AXLE

Caster— $-\frac{1}{4}^{\circ}$ + $\frac{1}{4}^{\circ}$.
Camber— $-\frac{1}{4}^{\circ}$ $-\frac{1}{2}^{\circ}$.
Toe-in— $0^{\prime\prime}$ $-\frac{1}{16}^{\prime\prime}$.
Kingpin Angle— 4° $-\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—N. D. Ball No. 5306 S. C. and Hyatt 1287465.
Bearing Adjustment—None; pinion adjustment, shims.
End Play—Not specified.
Lash—.004"--.008".
Diff. Bearing Type—Timken No. 1419335.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ qts.

TRANSMISSION

Make and Type—Own, helical gears.
Main Shaft Bearing Type and No.—N. D. No. 47508.
Countershaft Bearing Type and No.—Needle bearing.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $25\frac{7}{8}^{\prime\prime}$ x 2" x $\frac{3}{16}^{\prime\prime}$.
Adjustments
Eccentric for centralizing adjusting screw for clearance.
Sliding type anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort— $54\frac{1}{2}\%$ front, $45\frac{1}{2}\%$ rear.

CLUTCH

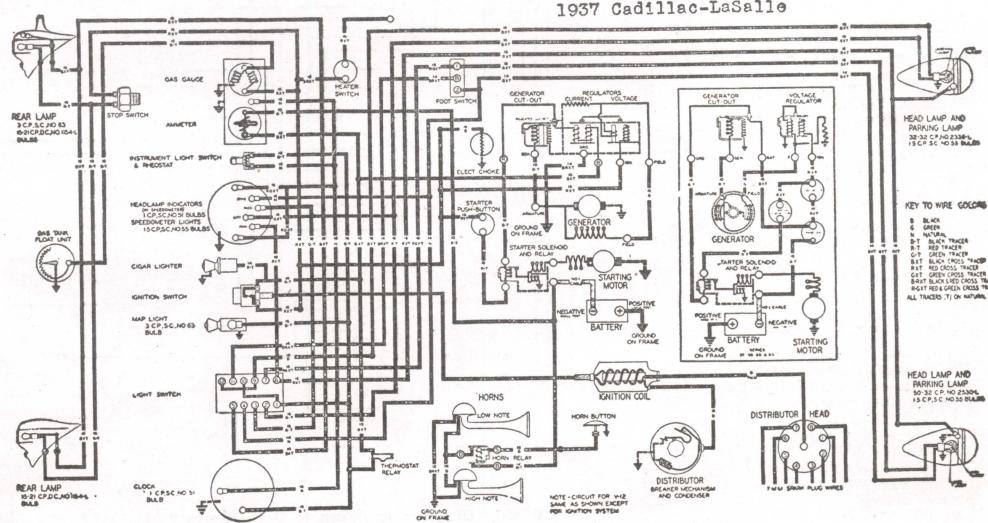
Type—Long single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. No. 7202.
Throwout Bearing Type and No.—N. D. Ball No. C. T. 30F.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Saginaw worm and roller.
Adjustments—Column end play—adjusting nut at bottom.
Cross-shaft end play—adjusting screw.
Mesh—Eccentric bearing mounting.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 727V (4-pole).
Drive—Solenoid shifted gear.
Rotation—Clockwise viewing pinion.
No Load—65 amps., 5 volts, 5500 r.p.m.
Lock Torque—16 ft. lbs., 600 amps., 3.0 volts.
Brush Spring Tension—24-28 ozs.

GENERATOR

Make—Delco-Remy, 918C.
Drive—40°V-belt.
Regulation—Voltage regulator.
Thermostat—None.
Output, cold—28-30 amps. max.
Output, hot—Actual rate controlled by condition of battery.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5-7.0 volts.
Amps. Discharge to Open—0-3.
Field Fuse—None.

IGNITION

Coil—Delco-Remy, 539-C.
Distributor—Delco-Remy, 665-G.
Distr. Rotation—Clockwise.
Breaker Gap—.0125"--.0175".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025"--.027".
Spark Plug Size—A. C. "K-7", 14 m/m.
Manual Advance—20°.
Automatic Advance—22°.
Timing—5° before top center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—Not given.

LAMPS

Head—R. H., 32-50 C. P.; L. H., 32-32 C. P.
Park—No. 55.
Instrument—No. 55, No. 63 and No. 51..
Fuse—None.
Stop and Tail—No. 1154L and No. 63.

1937 Cadillac-LaSalle

La Salle Model 36-50 1936

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—28.8.
Displacement—248 cu. in.
Firing Order—1-6-2-5-3-7-4.
Max. H. P.—105 @ 3600 r.p.m.

CAMSHAFT

Drive—Whitney No. C L-205 chain.
Chain Drive—46 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—6.
End Thrust Taken On—Front Bearing.
Bearing Clearance— $.002\frac{1}{2}$ "-.004".

CONNECTING RODS

End Clearance—.005".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $4\frac{1}{2}$ gals.
Pump Drive—Fan belt.
Belt Size— $49\frac{3}{4}$ " x $5\frac{1}{4}$ ", V-type.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—5.
Material—Bronze-backed babbitt.
End Thrust Taken On—No. 1 bearing, upper half.
End Clearance—.004".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Stromberg "E E—15".
Type—Downdraft.
Adjustment—Turn in for lean, out for rich mixture, for idling adjustment.
High speed non-adjustable.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—25 lbs. at 60 m.p.h.
Adjustment—None.
Winter Oil—S. A. E. No. 20.
Summer Oil—S. A. E. No. 40.

PISTONS

Material—Lynite Lo-Ex. alum. alloy.
T-slot anodized.
Clearance—Top—.015".
Clearance—Bottom—.0016-.002" top of skirt.
.0011"--.0015" bottom of skirt.

PISTON RINGS

Gap—Comp., .007"--.012"; Oil, .007"--.015".
No. Comp. Rings—2.
Width— $1.235\frac{1}{2}$ "-.1240".
No. Oil Rings—2.
Width—1— $1.154\frac{1}{2}$ "-.1550"; 1— $1.235\frac{1}{2}$ "-.1240".

PISTON PINS

Type—Locked in piston.
Fit in Piston—Free end .001" clearance; locked end .0003" press fit.
Fit in Rod—Push fit.

VALVES AND TAPPETS

Dia. Exhaust— $1.421\frac{1}{2}$ ".
Dia. Intake— $1.562\frac{1}{2}$ ".
Seat Dia.—Intake $.342\frac{1}{2}$ "—Exh., $.341\frac{1}{2}$ ".
Seat Angle—Intake 30°—Exh., 45°.
Seat Width— $.042\frac{1}{2}$ "-.052".
Clearance—Hot: Intake—.006".
Exhaust—.009".
Guides Removable—Yes.
Spring Pressure—43 lbs. at 2.250", valve closed.
96 lbs. at 1.906" valve open.

CHASSIS

FRONT AXLE

Caster— 2° .
Camber— 1° .
Toe-in— $\frac{1}{8}$ ".
Kingpin Angle— 4° — $51'$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—N. D. No. 5307 S. C. and Hyatt No. 1287465.
Adjustment—Pinion adjustment, shims, bearings—no adjustment.
End Play—None.
Lash—.004"—.008".
Diff. Bearing Type—Timken roller No. 372A.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—5 pts.

TRANSMISSION

Make and Type—Own—Synchro-mesh, helical gears.
Main Shaft Bearing Type and No.—N. D. Ball No. 47507.
Countershaft Bearing Type and No.—Hyatt No. 92424.

RAKES

Type—Bendix hydraulic.
Lining Type—Primary—moulded, secondary—woven.
Lining Size— $25\frac{1}{8}$ " x 2" x $\frac{3}{16}$ ".
Adjustments
Eccentric and adjusting wheel for clearance.
Anchor adjustment sliding type.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—Front 55%; rear 45%.

CLUTCH

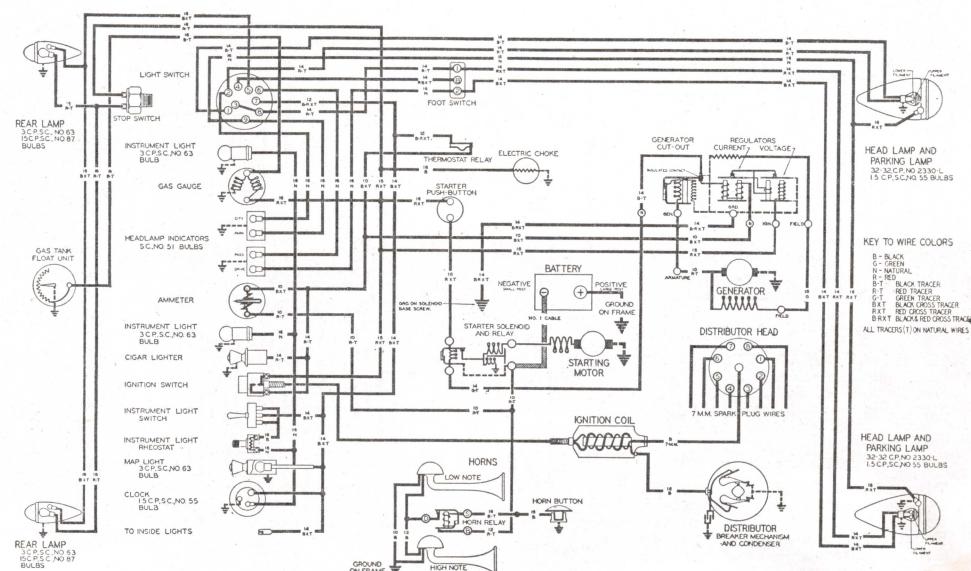
Type—Dry plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. Ball No. 7502.
Throwout Bearing Type and No.—Graphite, $1\frac{1}{2}$ " x $2\frac{3}{8}$ " x $\frac{5}{8}$ ".

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Not given.

STEERING GEAR

Type—Worm and roller, "Saginaw."
Adjustments—Column end play adjusting nut. Cross shaft end play—adjusting screw.
Eccentric for worm and roller mesh.
Lubricant—Steering gear lubricant.



Wiring Diagram applying to both Series 35-50, 1935, and Series 36-50, 1936, LaSalle cars.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy No. 727 N.
Drive—Solenoid shifted gear.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts at 5500 r.p.m.
Lock Torque—15 ft. lbs. at 600 amps., 30 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy No. 961 D.
Drive—Belt.
Regulation—Voltage and current regulation.
Thermostat—None.
Output, cold—22 amps.—8.1-8.3 volts—1900 r.p.m.
Output, hot—Due to voltage regulation, actual charging rate is controlled by state of charge of battery—constant above 1700 r.p.m.—20 m.p.h.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.8-7.3 volts—12 m.p.h.
Amps. Discharge to Open—0-2.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy.
Coil—Delco-Remy 539 C.
Distr. Rotation—Counter-clockwise, viewing drive end.
Breaker Gap—.0125"—.0175".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.025"—.027".
Spark Plug Size—A. C. "K-9" 14 m/m.
Manual Advance— 20° .
Automatic Advance— 28° .
Vacuum Advance— 18° .
Timing— 8° before top center.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—Delco, 110 amps hr., No. 17 K. W.

LAMPS

Head—32-32—C. P. No. 2330-L.
Park—1.5 C. P. No. 55. Map light No. 63.
Headlamp indicators No. 51.
Instrument—3 C. P. No. 63.
Fuse—None (Thermostat relay).
Dome—No. 87.
Stop and Tail—No. 63 and No. 87.

Lincoln V-12, 1938

ENGINE

DATA

No. of Cylinders—12.
Bore— $3\frac{1}{8}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—46.8.
Displacement—414.0 cu. in.
Firing Order—1-4-9-8-5-2-11-10-3-6-7-12.
Max. H. P.—150 at 3400 r.p.m.

CAMSHAFT

Drive—Chain, with automatic adjustment.
Chain Data—104 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Check to timing marks on flywheel.
Bearings—5, babbitt-lined, steel bushings.
End Thrust Taken On—Front bearing.
Bearing Clearance—.0005"-".002".

CONNECTING RODS

End Clearance—Total .006"-".015".
Dia. Clearance—.0015"-".003".

COOLING SYSTEM

Capacity—32 qts.
Pump Drive—Coupling off generator.
Belt Size— $45^{\circ}V$, $40\frac{3}{4}$ " x 1".
Belt Adjustment—Fan mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Copper-lead, steel back.
End Thrust Taken On—Rear bearing.
End Clearance—.004"—".007".
Dia. Clearance—.001"—".003".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Dual downdraft.
Adjustment—Idle—turn in to lean, out to enrich.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—12 qts.
Oil Pressure—40 lbs. at 50 m.p.h.
Adjustment—Non-adjustable.

Above	90° F...S.A.E. No. 40
Above	32° F...S.A.E. No. 30
Above	10° F...S.A.E. No. 20 or 20W.
Oil	Above -10° F...S.A.E. No. 10W.
	Below -10° F...S.A.E. No. 10W. plus 10% kerosene.

PISTONS

Material—Alum. alloy.
Clearance—Top—Not given.
Clearance—Bottom—.002".

PISTON RINGS

Gap—Comp., .008"-".015"; Oil, .007"-".015".
No. Comp. Rings—2.
Width— $1.235"$ -.1240".
No. Oil Rings—2.
Width— $1.545"$ -.1550".

PISTON PINS

Type—Locked in piston.
Fit in Piston—Not given.
Fit in Rod—.0005".

VALVES AND TAPPETS

Dia. Exhaust—1.687".
Dia. Intake—1.687".
Stem Dia.—.3125".
Seat Angle— 45° .
Seat Width— $\frac{3}{32}$ " max.
Tappet Type—Cylindrical.
Clearance—Hot; Intake—Automatic.
Exhaust—Automatic.
Guides Removable—Yes.
Spring Pressure—55-60 lbs. at 2.687".
130-140 lbs. at 2.343".

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ ° loaded.
Camber— $1\frac{1}{2}$ °.
Toe-in— $\frac{1}{16}$ "-. $\frac{1}{8}$ ".
Kingpin Angle— $7\frac{1}{2}$ °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Full floating, spiral bevel.
Pinion Bearing Type—Roller bearing.
Adjustment—Shims.
End Play—Not given.
Lash—.010".
Diff. Bearing Type—Roller bearing.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Synchro-mesh, helical gears.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Bendix mechanical.
Lining Type—Primary, moulded; secondary, woven.
Lining Size— $33\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{1}{4}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Single plate, semi-centrifugal.
Facing Type—Woven.
Pilot Bearing Type and No.—Ball.
Throwout Bearing Type and No.—Ball.

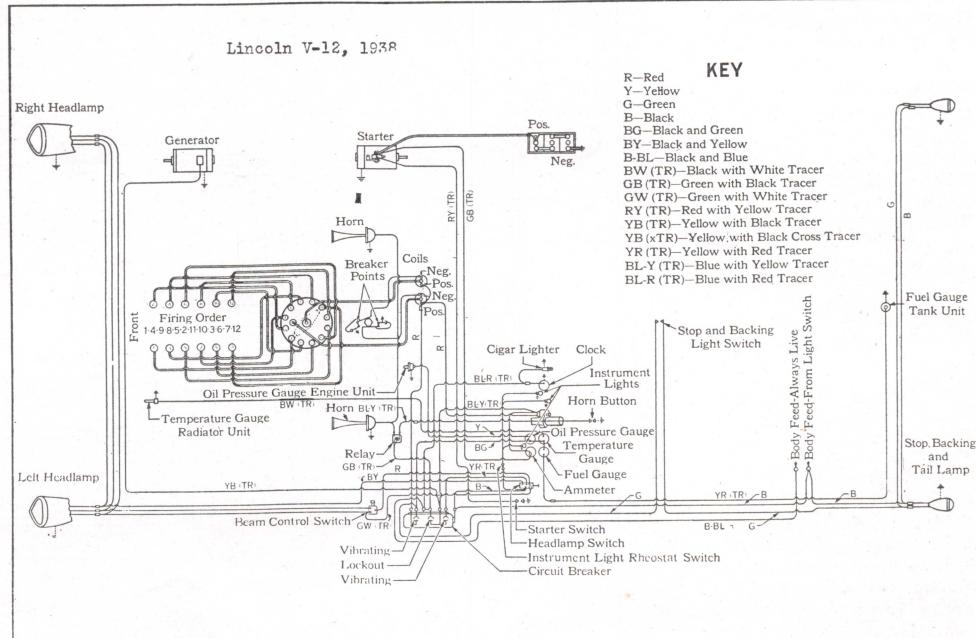
SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Cross-shaft—adjusting screw.
Mesh—eccentric.
Lubricant—Above freezing, S.A.E. 160.
Below freezing, S.A.E. 90.

Lincoln V-12, 1938



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Bendix.
Rotation—Counter-clockwise.
No Load—44 amps., 5.5 volts, 2700 r.p.m.
Lock Torque—14 ft. lbs., 715 amps., 3.0 volts (max. torque 33 ft. lbs.).
Brush Spring Tension—24-32 oz.

GENERATOR

Make—Auto-Lite.
Drive—Chain.
Regulation—Third brush.
Thermostat—None.
Output, cold—22 amps., 8.0 volts, 1300 r.p.m.
Output, hot—16 amps., 8.0 volts, 1300 r.p.m.
Brush Spring Tension—22-27 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.75-7.5 volts at 10 m.p.h.
Amps. Discharge to Open—3.0 amps.
Field Fuse—Not specified.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Counter-clockwise, viewed from top.
Breaker Gap—.020".
Brush Spring Tension—14-16 oz.
Spark Plug Gap—.028"-".030".
Spark Plug Size—18 m/m Champion No. 7.
Manual Advance—None.
Automatic Advance— 17° max. crankshaft.
Timing—Top dead center.
Coil Amps., Engine Idling—1.5 amps.
Coil Amps., Engine Stopped—5.0 amps.

BATTERY

Amps.—147 amp. hour.

LAMPS

Head—32-32 c. p.
Park— $1\frac{1}{2}$ c. p.
Instrument—6 c. p.
Fuse—Not given.
Dome—6 c. p.
Stop and Tail—21 and 3 c. p.

Lincoln 12, 1937

ENGINE

DATA

No. of Cylinders—12 (67° included angle).
 Bore— $3\frac{1}{8}$ ".
 Stroke— $4\frac{1}{2}$ ".
 Taxable H. P.—46.8.
 Displacement—414.0 cu. in.
 Firing Order—1-4-9-8-5-2-11-10-3-6-7-12.
 Max. H. P.—150 at 3400 r.p.m.

CAMSHAFT

Drive—Chain (Automatic Adjustment).
 Chain Data—104 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
 Valve Timing—Check to timing marks on flywheel.
 Bearings—5-Babbitt lined bronze bushings.
 End Thrust Taken On—Front bearing.
 Bearing Clearance—.0005"--.002".

CONNECTING RODS

End Clearance—.006"--.015".
 Dia. Clearance—.0015"- to .003".

COOLING SYSTEM

Capacity—32 qts.
 Pump Drive—Off Generator.
 Belt Size—45° V-40 $\frac{3}{4}$ " outside x 1".
 Belt Adjustment—Fan mounting.
 Pump Pack, Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
 Material—Copper-lead, steel backed.
 End Thrust Taken On—Rear bearing.
 End Clearance—.004"--.007".
 Dia. Clearance—.001"--.003".

FUEL SYSTEM

Carburetor Make—Stromberg "EE."
 Type—Dual downdraft.
 Adjustment—Turning idle adjustment out gives richer mixture; in gives a leaner mixture.
 Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
 Pump Type—Gear.
 Capacity—12.
 Oil Pressure—40 lbs. at 50 m.p.h.
 Adjustment—Non-adjustable.

Oil—
 Summer S. A. E. No. 40.
 Winter S. A. E. 20-W.

S. A. E. No. 20 may be used when winter temperature is above freezing.

PISTONS

Material—Alum. Alloy.
 Clearance—Top—Not given.
 Clearance—Bottom—.002".

PISTON RINGS

Gap—Comp. .008"--.015"; oil .007"- .015".
 No. Comp. Rings—2.
 Width—.1235"--.1240".
 No. Oil Rings—2,
 Width—.1545"--.1550".

PISTON PINS

Type—Locked in Piston.
 Fit in Piston—Not given.
 Fit in Rod—.0005".

VALVES AND TAPPETS

Dia. Exhaust—1.687".
 Dia. Intake—1.687".
 Stem Dia.— $\frac{5}{16}$ ".
 Seat Angle—45°.
 Seat Width— $\frac{3}{32}$ " max.
 Tappet Type—Hydraulic.
 Clearance—Hot: Intake—Automatic.
 Exhaust—Automatic.
 Guides Removable—Yes.
 Spring Pressure—55-60 lbs. at 2.687".
 130-140 lbs. at 2.343"

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ ° loaded.
 Camber—1°.
 Toe-in— $\frac{1}{16}$ "-. $\frac{1}{8}$ ".
 Kingpin Angle— $7\frac{1}{2}$ °.
 Tie Rod Adjustment—Thread.

REAR AXLE

Type—Spiral bevel—Full floating type.
 Pinion Bearing Type—Roller bearing.
 Adjustment—Shims.
 End Play—Not given.
 Lash—.010".
 Diff. Bearing Type—Roller bearing.
 Adjustment—Thread.
 End Play—Not given.
 Lubricant Capacity—Housing—6 pints.

TRANSMISSION

Make and Type—Own, helical gear type.
 Main Shaft Bearing Type and No.—Ball.
 Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Mechanical.
 Lining Type—Moulded.
 Lining Size— $3\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{1}{4}$ ".
 Adjustments—Eccentric for Centralizing;
 Adjusting screw for clearance; Adjustable anchor.
 Clearance
 Top—.010".
 Bottom—.010".
 Brake Effort—50-50.

CLUTCH

Type—Single plate.
 Facing Type—Woven.
 Pilot Bearing Type and No.—Ball.
 Throwout Bearing Type and No.—Gur. 211 CTQ.

SPRINGS

Type Front—Semi-elliptic.
 Type Rear—Semi-elliptic.
 Shackle adjustment—Metal-Thread.

STEERING GEAR

Type—Worm and roller.
 Adjustments—Column end play—shims under lower cover. Cross-shaft—adjusting screw.
 Mesh—eccentric.
 Lubricant—Above freezing, S.A.E. 160 E.P.
 below freezing, S.A.E. 90 or 110 E.P.

PISTONS

Material—Alum. Alloy.
 Clearance—Top—Not given.
 Clearance—Bottom—.002".

PISTON RINGS

Gap—Comp. .008"--.015"; oil .007"- .015".
 No. Comp. Rings—2.
 Width—.1235"--.1240".
 No. Oil Rings—2,
 Width—.1545"--.1550".

PISTON PINS

Type—Locked in Piston.
 Fit in Piston—Not given.
 Fit in Rod—.0005".

VALVES AND TAPPETS

Dia. Exhaust—1.687".
 Dia. Intake—1.687".
 Stem Dia.— $\frac{5}{16}$ ".
 Seat Angle—45°.
 Seat Width— $\frac{3}{32}$ " max.
 Tappet Type—Hydraulic.
 Clearance—Hot: Intake—Automatic.
 Exhaust—Automatic.
 Guides Removable—Yes.
 Spring Pressure—55-60 lbs. at 2.687".
 130-140 lbs. at 2.343"

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
 Drive—Bendix.
 Rotation—Counter-clockwise.
 No Load—44 amps., 5.5 volts, 2700 r.p.m.
 Lock Torque—14 ft. lbs., 715 amps., 3 volts.
 Brush Spring Tension—24-32 oz.

GENERATOR

Make—Auto-Lite.
 Drive—Chain.
 Regulation—Third brush and voltage control.
 Output, cold—22 amps., 8.0 volts, 1300 rpm
 Output, hot—16 amps., 8.0 volts, 1300 rpm
 Brush Spr. Tension—22-27 oz.
 Rotation—Clockwise, viewing drive end.
 Cutout to close—6.75-7.5 volts at 10 m.p.h.
 Amps. Discharge to Open—2.0-3.0.

IGNITION

Distributor—Auto-Lite.
 Coil—Auto-Lite.
 Distr. Rotation—Counter-clockwise viewed from top.
 Breaker Gap—.020".
 Brush Spr. Tension—14-16 oz.
 Sp. Plug Gap—.025".
 Sp. Plug Size—Champion No. 7, 18 m/m.
 Manual Advance—None.
 Automatic Adv.—17° crankshaft.
 Timing—Top dead center.
 Coil Amps., Engine Idling—1.5.
 Coil Amps., Engine Stopped—5.

BATTERY

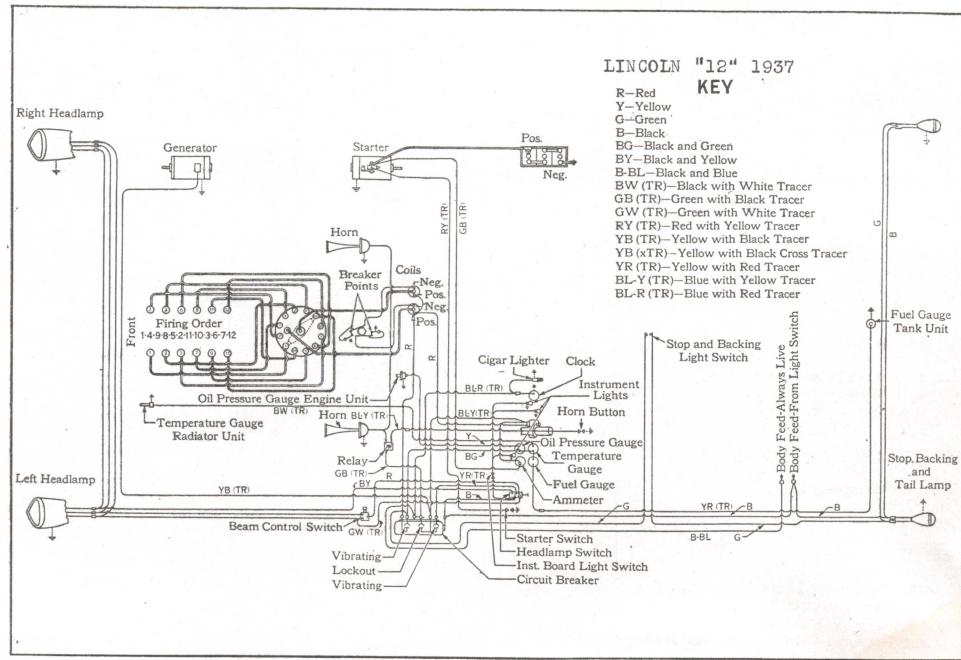
Amps—147 amp hours.

LAMPS

Head—32-32 C. P.
 Park— $1\frac{1}{2}$ C. P.
 Instrument—6 C. P.
 Dome—6 C. P.
 Stop and Tail—21-3 C. P.

LINCOLN "12" 1937 KEY

R—Red
 Y—Yellow
 G—Green
 B—Black
 BG—Black and Green
 BY—Black and Yellow
 B BL—Black and Blue
 BW (TR)—Black with White Tracer
 GB (TR)—Green with Black Tracer
 GW (TR)—Green with White Tracer
 RY (TR)—Red with Yellow Tracer
 YB (TR)—Yellow with Black Cross Tracer
 YB (xTR)—Yellow with Red Tracer
 BL—Y (TR)—Blue with Yellow Tracer
 BL-R (TR)—Blue with Red Tracer



Lincoln-Zephyr, 1937

ENGINE

DATA

No. of Cylinders—12 (75° V-L head) m/h.
Bore— $2\frac{3}{4}$ ".
Stroke— $3\frac{3}{4}$ ".
Taxable HP.—36.3.
Displacement—267.28 cu. in.
Firing Order—1-4-9-8-5-2-11-10-3-6-7-12.
Max. HP.—110 at 3900 r.p.m.

CAMSHAFT

Drive—Gears.
Valve Timing—Punch marks on gear in alignment.
Bearings—4 babbitt steel backed.
End Thrust Taken On—Front end.
Bearing Clearance—.0015"--.003".
Copper-Lead bearings.

CONNECTING RODS

Dia. Clearance—.0015"--.003".

COOLING SYSTEM—Two Pumps

Capacity—27 qts.
Pump Drive—V-Belt.
Belt Size— $28^{\circ}V$ - $54.4^{\prime \prime} \times .63^{\prime \prime}$.
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Copper-lead, steel back.
End Thrust Taken On—Rear bearing.
End Clearance—.002"--.006".
Dia. Clearance—.001"--.003".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Dual down draft, 1" dia.
Adjustment—Turning idle adjustment out gives richer mixture; in a leaner mixture.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6.
Oil Pressure—30 lbs. at 55 m.p.h.
Adjustment—Non-adjustable.
Above 90°F, S. A. E. 50.
30°F to 100°F, S. A. E. 40.
20°F to 65°F, S. A. E. 30.
Oil 0°F to 50°F, S. A. E. 20 or 20-W.
15°F to 30°F, S. A. E. 10 or 10-W.
10°F or lower, S. A. E. 10-W.
+ 10% Kerosene.

PISTONS

Material—Heat treated steel alloy.
Clearance—Top—Not given.
Clearance—Bottom—.002" (5 lbs. pull on $\frac{1}{2}$ " feeler).

PISTON RINGS

Gap—.008"--.013".
No. Comp. Rings—2.
Width—.093"--.0935".
No. Oil Rings—1.
Width—.1545"--.155".

PISTON PINS

Type—Floating.
Fit in Piston—+.0001" or —.0001"
slip.
Fit in Rod—.0002"--.0009".

VALVES AND TAPPETS

Dia. Exhaust—1.537".
Dia. Intake—1.537".
Seat Dia.—.311.
Seat Angle—45°.
Seat Width— $\frac{3}{32}$ " max.
Tappet Type—Cylindrical
(Special Ford).
Clearance—Hot: Intake—.0125"-
.0135".
Exhaust—.0125"--.0135".
Spring Pressure—32-36 lbs., valve open.
closed. 62-66 lbs., valve open.

CHASSIS

FRONT AXLE

Caster—4° loaded.
Camber— $\frac{3}{4}$ °.
Toe-in— $\frac{3}{16}$ ".
Kingpin Angle—4°.
Tie Rod Adj.—Thread.

REAR AXLE

Type— $\frac{3}{4}$ floating-straddle pinion mounting.
(spiral bevel).
Pinion Bearing Type—Taper and straight roller.
Adjustment—Thread.
End Play—12 to 17 inch lbs. on adjustment.
Lash—.006"--.010".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ to 3 pts.

TRANSMISSION

Make and Type—3 speed synchronized helical gears.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Mechanical.
Lining Type—Moulded.
Lining Size— $23.9^{\prime \prime} \times 1.75^{\prime \prime} \times 21^{\prime \prime}$
Adjustments—Single internal adjustment at each wheel, eccentric for centralizing; adjusting screw for clearance.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—10" single plate, semi-centrifugal.
Facing Type—Moulded.
Pilot Bearing Type and No.—Ball ND-7503.
Throwout Bearing Type and No.—Ball
Nice 5015-1.

SPRINGS

Type Front—Transverse leaf.
Type Rear—Transverse leaf.
Shackle Adjustment—Oilless Type.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims at bottom; Cross shaft adjusting screw.
Lubricant—Above 32°F, S. A. E. 160 E.P.
Below 32°F, S. A. E. 90 or 110 E. P.

ELECTRICAL DATA

STARTING MOTOR

Make—Own.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—Not given.
Lock Torque—14 ft. lbs., 225 amps., 4.75 volts.
Brush Spring Tension—32 oz.

GENERATOR

Make—Own.
Drive—Belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—18 amps.
Output, hot—15 amps at 30 m.p.h.
Brush Spr. Tension—20 oz.
Rotation—Clockwise viewing drive end.
Cutout to close—7 volts at 10 m.p.h.
Amps. Discharge to Open—3.
Field Fuse—Not given.

IGNITION

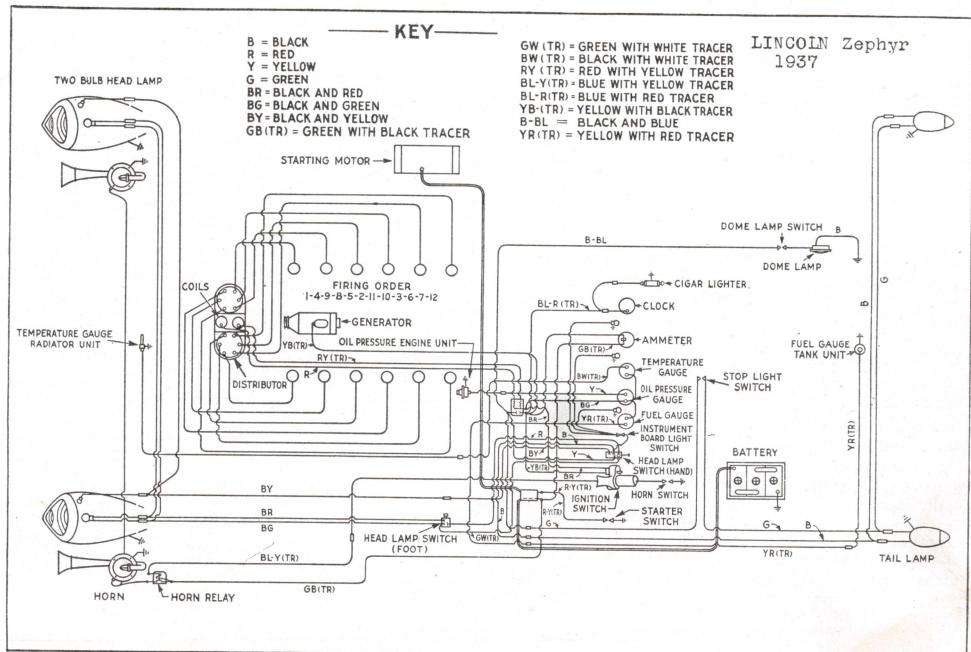
Distributor—Own.
Coil—Own (2).
Distr. Rotation—Counter-clockwise viewed from front.
Breaker Gap—.014"--.016".
Brush Spr. Tension—20-24 oz.
Sp. Plug Gap—.028"--.030".
Sp. Plug Size—14m/m.
Manual Advance—None.
Automatic Adv.—Max. 20° crankshaft.
Timing—4° before top dead center.
Coil Amps., Engine Idling—3.2.
Coil Amps., Engine Stopped—4.2.

BATTERY

Amps.—100 amp. hour.

LAMPS

Head—32-32 C. P.
Park—3 C. P.
Instrument—3 C. P.
Fuse—None.
Dome—15 C. P.
Stop and Tail—3 C. P. and 21 C. P.



Nash Ambassador 6, 1938

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—27.34.
Displacement—234.8.
Firing Order—1-5-3-6-2-4.
Max. H. P.—105 at 3400 r.p.m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—60 links, $\frac{9}{16}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Coincidental sprocket marking.
Bearings—6.
End Thrust Taken On—Spring plunger.
Bearing Clearance—Not given.

CONNECTING RODS

End Clearance—.010".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity—20 qts.
Pump Drive—Generator shaft.
Belt Size—32"V.
Belt Adjustment—Fan mounting.
Pump Pack, Adj.—Thread.

CRANKSHAFT

No. Bearings—7.
Material—Babbitt, steel-backed.
End Thrust Taken On—Center bearing.
End Clearance—.004".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Marvel.
Type—Single downdraft.
Adjustment—Idle—turn in lean; out to rich.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—30 lbs. at 20 m.p.h.
Adjustment—Not given.

Oil	Above 80° F.....	S.A.E. 30
	40° - 80° F.....	S.A.E. 20
	-10° - 40° F.....	S.A.E. 10W

Below -10° F..... S.A.E. 10W.
plus 10% kerosene.

PISTONS

Material—Bohn alum., split skirt, steel strut.
Clearance—Top—.022".
Clearance—Bottom—.0015".

PISTON RINGS

Gap—.014".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0001" average.
Fit in Rod—.0001" average.

VALVES AND TAPPETS

Dia. Exhaust— $1.593^{\prime\prime}$.
Dia. Intake— $1.75^{\prime\prime}$.
Stem Dia.— $.3725^{\prime\prime}$.
Seat Angle— 45° .
Seat Width—Int., $\frac{1}{16}$ "; Exh., $\frac{3}{32}$ ".
Tappet Type—Mushroom.
Clearance—Hot:
 Intake—Min., .008".
 Exhaust—.015".
 (Same for valve timing).
Guides Removable—Yes.
Spring Pressure—Not given.
Inner 2"; Outer $1\frac{1}{2}\frac{5}{32}$ " free length.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}^{\circ}$.
Camber— $1\frac{1}{2}^{\circ}$.
Toe-in—0".
Kingpin Angle— 7° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lash—.007".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—4 lbs.

TRANSMISSION

Make and Type—Own.
Main Shaft Bearing Type and No.—Taper roller.
Countershaft Bearing Type and No.—Plain.

BRAKES

Type—Bendix hydraulic.
Lining Type—Woven and moulded.
Lining Size— $22^{\prime\prime}$ x $2^{\prime\prime}$ x $\frac{1}{32}$ ".
Adjustments—Eccentric for centralizing.
 Adjusting screw for clearance.
 Adjustable anchor.
Clearance—Top—.010".
 Bottom—.010".
Brake Effort—53% front; 47% rear.

CLUTCH

Type—B. & B. single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Plain.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded "U".

STEERING GEAR

Type—Gemmer.
Adjustments
 Column end play—shims lower cover.
 Cross-shaft end play—adjusting screw.
 Mesh—Not given.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAB 4076.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5.5 volts, 2700 r.p.m.
Lock Torque— $21\frac{1}{2}$ ft. lbs., 750 amps., 4.0 volts.
Brush Spring Tension—42.53 oz., with new brushes.

GENERATOR

Make—Auto-Lite—GCM 4803-B.
Drive—Belt.
Regulation—Third brush (voltage regulator optional).
Thermostat—None.
Output, cold—18 amps., 8.0 volts, 2600 r.p.m.
Output, hot—18 amps., 8.0 volts, 2800 r.p.m.
Brush Spring Tension—22.26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0-7.5 volts at 780 r.p.m.
 armature speed (9 m.p.h.).
Amps. Discharge to Open—1.5-2.5.
Field Fuse—Not specified.

IGNITION

Distributor—Auto-Lite—IGE—4018 "Twin Ign."

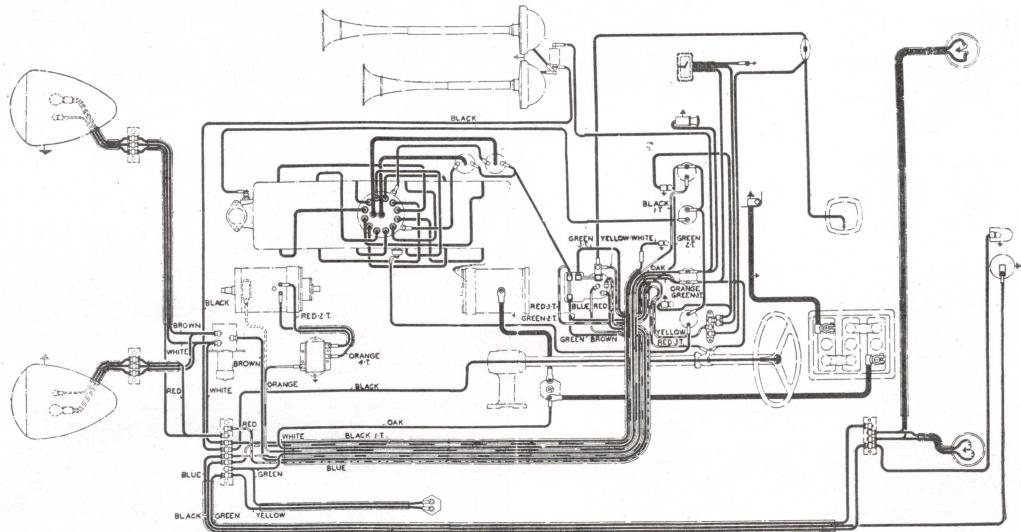
Coil—Auto-Lite.
Distr. Rotation—Counter-clockwise, viewed from top.
Breaker Gap—.020" (synchronize points).
Brush Spring Tension—16.20 oz.
Spark Plug Gap—.025".
Spark Plug Size—A. C. "45"—14 m/m.
Manual Advance—None.
Automatic Advance— 26° .
Timing— 4° before top dead center ("IGN" mark on front flywheel).
Coil Amps., Engine Idling—2.0. amps.
Coil Amps., Engine Stopped—5.0. amps.

BATTERY

Amps.—105 amp. hr.

LAMPS

Head—32-32 c. p.—6-8 v.
Park—3 c. p.—6-8 v.
Instrument—3 c. p.—6-8 v.
Fuse—Not specified.
Dome—6 c. p.—6-8 v.
Stop and Tail—3-21 c. p.—6-8 v.



Nash Ambassador 8, 1938

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{8}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—31.25.
Displacement—260.8.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—115 at 3400 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—62 links, $\frac{1}{16}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Coincidental sprocket marking.
Bearings—6.
End Thrust Taken On—Spring plunger.
Bearing Clearance—Not given.

CONNECTING RODS

End Clearance—.010".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity—18 qts.
Pump Drive—Generator shaft.
Belt Size— $32^{\prime \prime} \times 3^{\prime \prime}$.
Belt Adjustment—Fan bracket.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—9.
Material—Babbitt, steel-backed.
End Thrust Taken On—Center bearing.
End Clearance—.004".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Stromberg "EE-7".
Type—Dual downdraft.
Adjustment—Idle—turn in to lean; out to rich.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—30 lbs. at 20 m.p.h.
Adjustment—Not given.
Oil { Above 80° F..... S.A.E. 30
40°-80° F..... S.A.E. 20
—10°-40° F..... S.A.E. 10W.
Below -10° F..... S.A.E. 10W.
plus 10% kerosene.

PISTONS

Material—Bohn alum., split skirt, steel strut.
Clearance—Top—.020".
Clearance—Bottom—.0015".

PISTON RINGS

Gap—.014".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0001".
Fit in Rod—.0001".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{21}{32}$ ".
Stem Dia.—.375".
Seat Angle—45°.
Seat Width—Int., $\frac{1}{16}$ "; Exh., $\frac{3}{32}$ ".
Tappet Type—Not given.
Clearance—Hot:
Intake—.015".
Exhaust—.015".
(Same for valve timing).
Guides Removable—Yes.
Spring Pressure—Not given.
Free length—Inner, 2";
Outer, $1\frac{15}{32}$ ".

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ °.
Camber— $1\frac{1}{2}$ °.
Toe-in—0".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lash—.007".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—6 lbs.

TRANSMISSION

Make and Type—Own.
Main Shaft Bearing Type and No.—Not given.
Countershaft Bearing Type and No.—Not given.

BRAKES

Type—Bendix hydraulic.
Lining Type—Woven and moulded.
Lining Size— $2\frac{1}{4}$ " x $\frac{1}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—53% front; 47% rear.

CLUTCH

Type—B & B, single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Graphite bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded "U."

STEERING GEAR

Type—Gemmer.
Adjustments
Column end play—shims.
Cross-shaft end play—adjusting screw.
Mesh—Not given.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAB 4054.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque— $21\frac{1}{2}$ ft. lbs., 750 amps., 4.0 volts.
Brush Spring Tension—44-56 oz.

GENERATOR

Make—Auto-Lite—GCO 4802B.
Drive—Belt.
Regulation—Voltage and current regulator.
Thermostat—Not specified.
Output, cold—28 amps., 8.0 volts, 1800 r.p.m.
Output, hot—28 amps., 8.0 volts, 2200 r.p.m.
Brush Spring Tension—Worn, 24 oz.; new, 36 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0-7.5 volts at 9.6 m.p.h.
Amps. Discharge to Open—1.5-2.5.
Field Fuse—Not specified.

IGNITION

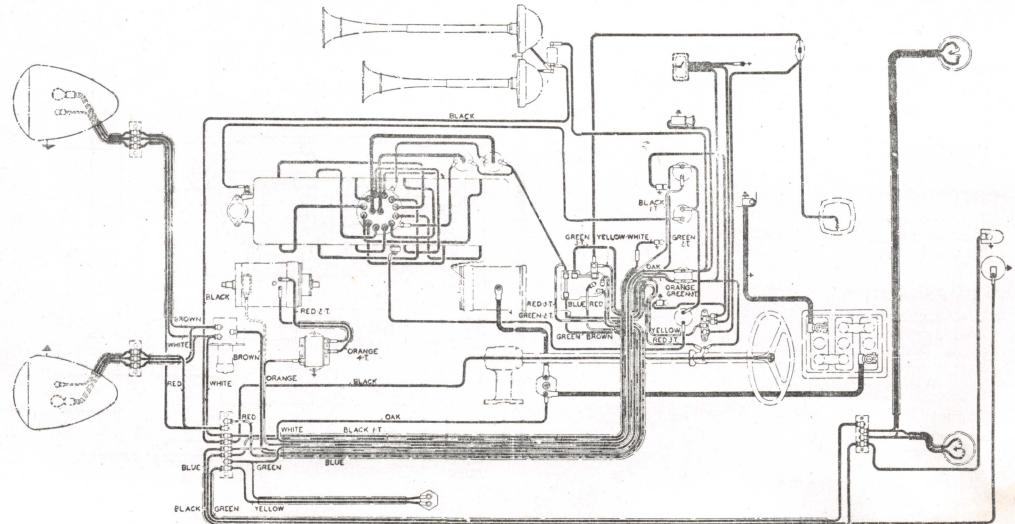
Distributor—Auto-Lite—IGK 4102.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spring Tension—16-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—A. C. "45"—14 m/m.
Manual Advance—None.
Automatic Advance— 24° .
Timing— 9° before top dead center ("IGN" mark on front flywheel).
Coil Amps., Engine Idling—2.5.
Coil Amps., Engine Stopped—4.0.

BATTERY

Amps.—120 amp. hr.

LAMPS

Head—32-32 c. p.—6-8 v.
Park—3 c. p.—6-8 v.
Instrument—3 c. p.—6-8 v.
Fuse—Not specified.
Dome—6 c. p.—6-8 v.
Stop and Tail—3-21 c. p.—6-8 v.



This diagram applies, except ignition and clutch pedal starter control.

Nash-LaFayette, 1938

MASTER and DE LUXE

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—27.34.
Displacement—234.8.
Firing Order—1-5-3-6-2-4.
Max. H. P.—95 at 3400 r.p.m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—60 links, $\frac{9}{16}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Coincidental sprocket markings.
Bearings—6.
End Thrust Taken On—Spring plunger.
Bearing Clearance—Not given.

CONNECTING RODS

End Clearance—.010".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity—20 qts.
Pump Drive—Fan belt.
Belt Size— $32\frac{1}{2}$ V".
Belt Adjustment—Fan bracket.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—7.
Material—Babbitt, steel-backed.
End Thrust Taken On—Center bearing.
End Clearance—.004".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Stromberg Ex-22.
Type—Downdraft single.
Adjustment—Idle—in for lean; out for rich mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—30 lbs. at 20 m.p.h.
Adjustment—Not given.
Winter Oil—S.A.E. No. 20.
Summer Oil—S.A.E. No. 30.

PISTONS

Material—Bohn alum., split skirt, steel strut.
Clearance—Top—.022".
Clearance—Bottom—.0015".

PISTON RINGS

Gap—.010".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0001" average.
Fit in Rod—.0001" average.

VALVES AND TAPPETS

Dia. Exhaust— $11\frac{1}{2}$ ".
Dia. Intake— $12\frac{1}{2}$ ".
S'en Dia.—.3402".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Mushroom.
Clearance: Hot—.015";
Intake—.015";
Exhaust—.015".
(Same for valve timing).
Guides Removable—Yes.
Spring Pressure—Not given.
Free length $2\frac{1}{2}$ ".

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ °.
Camber— $1\frac{1}{2}$ °.
Toe-in—0".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lash—.007".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—4 lbs.

TRANSMISSION

Make and Type—Own.
Main Shaft Bearing Type and No.—Timken
359S-352A and 2793-2720.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Bendix hydraulic.
Lining Type—Woven and Moulded.
Lining Size—Master, $21\frac{1}{2}$ " x $2\frac{1}{2}$ " x $7\frac{1}{32}$ ".
DeLuxe, $22\frac{1}{2}$ " x $2\frac{1}{2}$ " x $7\frac{1}{32}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—53% front; 47% rear.

CLUTCH

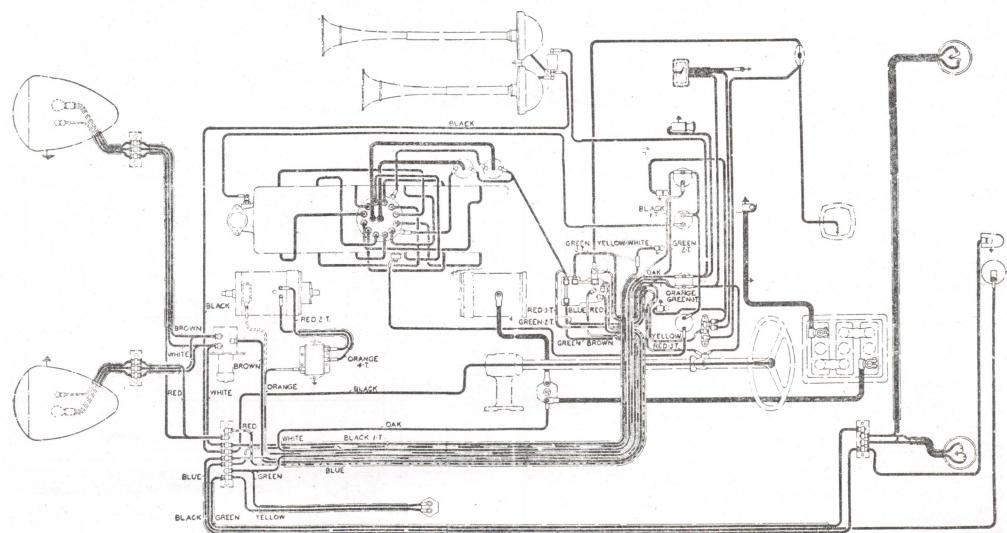
Type—B. & B. single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Graphite bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded "U."

STEERING GEAR

Type—Gemmer.
Adjustments
Column end play—shims lower cover.
Cross-shaft end play—adjusting screw.
Mesh—Not given.
Lubricant—Steering gear lubricant.



This diagram applies, except ignition system and voltage control optional

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAB 4076.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque— $21\frac{1}{2}$ ft. lbs., 750 amps., 4.0 volts.
Brush Spring Tension—42-53 oz., with new brushes.

GENERATOR

Make—Auto-Lite—GCM 4803-B.
Drive—Belt.
Regulation—Third brush (voltage regulator optional).
Thermostat—None.
Output, cold—18 amps., 8.0 volts, 2600 r.p.m.
Output, hot—18 amps., 8.0 volts, 2800 r.p.m.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0-7.5 volts at 780 r.p.m.
armature speed (9 m.p.h.).
Amps. Discharge to Open—1.5-2.5.
Field Fuse—Not given.

IGNITION

Distributor—Auto-Lite—IGC 4276.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.022".
Brush Spring Tension—16-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—Auto-Lite "B-7," 18 m/m.
Manual Advance—None.
Automatic Advance—30°.
Timing—4° after top dead center ("IGN" mark on front flywheel).
Coil Amps., Engine Idling—2.5 amps.
Coil Amps., Engine Stopped—4.0 amps.

BATTERY

Amps.—105 amp. hr.

LAMPS

Head—32-32 c. p.—6-8 v.
Park—3 c. p.—6-8 v.
Instrument—3 c. p.—6-8 v.
Fuse—Not specified.
Dome—6 c. p.—6-8 v.
Stop and Tail—3-21 c. p.—6-8 v.

Nash-Lafayette 400, 1937

MODEL 3710

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable HP.—27.34.
Displacement—234 cu. in.
Firing Order—1-5-3-6-2-4.
Max. HP.—90 at 3400 r.p.m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—60 links, $\frac{1}{16}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—6.
End Thrust Taken On—Spring plunger.
Bearing Clearance—Not given.

CONNECTING RODS

End Clearance—.008".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity—2 $\frac{1}{2}$ qts.
Belt Size— $32^{\circ}V-47x2\frac{5}{8}2$ ".
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—7.
Material—Steel backed babbitt.
End Thrust Taken On—No. 4 bearing.
End Clearance—.004"- .006".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Stromberg "EX22."
Type—Downdraft single.
Adjustment—Idle only; in gives leaner mixture; out, richer mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—Normal 25-35 lbs.
Adjustment—Not given.
Oil $\left\{ \begin{array}{l} 32^{\circ}-95^{\circ} F-S. A. E. No. 30. \\ 10^{\circ}-75^{\circ} F-S. A. E. No. 20 \\ -10^{\circ}-32^{\circ} F-S. A. E. No. 10-W. \end{array} \right.$

PISTONS

Material—Alum. alloy with invar strut.
Clearance—Top—.022".
Clearance—Bottom—.002".

PISTON RINGS

Gap—.010".
No Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2.
Width— $1\frac{1}{8}$ " and $1\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0001" push fit piston heated.
Fit in Rod—.0001" push fit, cold.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{8}2$ ".
Dia. Intake— $1\frac{1}{8}2$ ".
Stem Dia.—.341".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Clearance—Hot: Intake—.015".
Exhaust—.015".
Guides Removable—Yes.
Spring Pressure—Not given.

CHASSIS

FRONT AXLE

Caster— $1^{\circ}-2^{\circ}$.
Camber— $0^{\circ}-1\frac{1}{2}^{\circ}$.
Toe-in— $0^{\circ}-\frac{1}{8}$ ".
Kingpin Angle—7°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lash—.006".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—4 lbs.

TRANSMISSION

Make and Type—Synchro-mesh.
Main Shaft Bearing Type and No.—Timken 359S-352A and 2793-2720.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $22\frac{1}{16}x2\frac{1}{8}x\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing shoes. Adjusting screws for clearance.
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—47% front; 53% rear.

CLUTCH

Type—B and B single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Graphite bronze.
Throwout Bearing Type and No.—AET. A899.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims at lower cover. Cross shaft end play—adjusting screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—60 amps., 5.5 volts, 3700 r.p.m.
Lock Torque—21 ft. lbs., 750 amps., 4 volts.
Brush Spring Tension—42-53 oz. with new brushes.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—22 amps., 8 volts, 2800 r.p.m.
Output, hot—18 amps., 8 volts, 2800 r.p.m.
Brush Spr. Tension—22-26 oz.
Rotation—Clockwise viewing drive end.
Cutout to Close—7 volts at 10 m.p.h.
Amps Discharge to Open—2.0.
Field Fuse—7.5 amps.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spr. Tension—16-20 oz.
Sp. Plug Gap—.025".
Sp. Plug Size—A. C. 18 m/m "G-8."
Manual Advance—None.
Automatic Adv.—24°.
Timing—Set timing to IGN mark on vibration damper—10 degrees before top center.

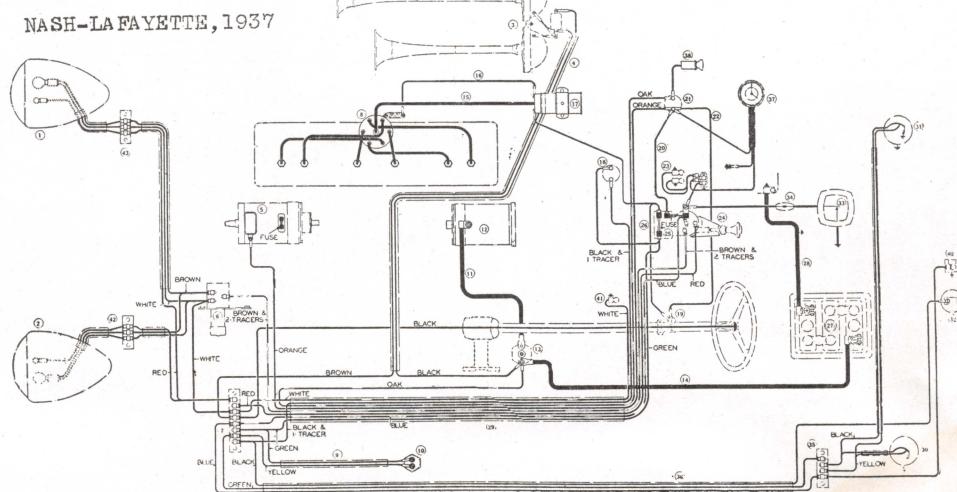
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopper—5.0.

BATTERY

Amps.—100 amp. hour.

LAMPS

Head—32-32 CP., 6-8 V., Flange type.
Park—3 CP., 6-8V., S. C.
Instrument—3 CP., 6-8V., S. C.
Dome—6 CP., 6-8V., S. C.
Stop and Tail—3-21 CP., 6-8V., D.C., D.F.



Lafayette, 1936

MODEL 3610

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—25.35.
Displacement—217.76 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—83 at 3200 r.p.m.

CAMSHAFT

Drive—Diamond chain.
Chain Data—60 links, $\frac{9}{16}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—6.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.008"- .012".
Dia. Clearance—.002"- .003".

COOLING SYSTEM

Capacity—19 qts.
Pump Drive—Belt.
Belt Size—Not given
Belt Adjustment—Fan bracket.
Pump Pack Adj.—Thread

CRANKSHAFT

No. Bearings—7.
Material—Steel-backed, babbitt lined.
End Thrust Taken On—Center bearing.
End Clearance—.004"- .007"
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Marvel.
Type—Downdraft.
Adjustment—Idle—In, lean; out, rich..
High speed, fixed.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—20 lbs. at 20 m.p.h.
Adjustment—Not given
Oil { 32° F.—.95° F. S.A.E. No. 30
10° F.—.75° F. S.A.E. No. 20W.
—10° F.—.32° F. S.A.E. No. 10W.

PISTONS

Material—Alum. alloy, invar strut.
Clearance—Top—.020"
Clearance—Bottom—.002".

PISTON RINGS

Gap—.010"—.025".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $1\frac{1}{8}$ ", $1\frac{9}{16}$ ".

PISTON PINS

Type—Not given.
Fit in Piston—Light push fit, piston heated.
Fit in Rod—Light push fit, parts cold.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{3}{8}$ ".
Dia. Intake— $1\frac{1}{2}$ ".
Stem Dia.—Not given.
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.015".
Exhaust—.015".
Guides Removable—Yes.
Spring Pressure—Not given

CHASSIS

FRONT AXLE

Caster— $2^{\circ}.4^{\circ}$.
Camber— $0^{\circ}.1\frac{1}{2}^{\circ}$.
Toe-in— $0\frac{1}{8}$ " max.
Kingpin Angle— 7° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Spiral bevel, semi-floating.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Zero.
Lash—Not given.
Diff Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—3 lbs. S.A.E.,
No. 90 E. P.

TRANSMISSION

Make and Type—Synchro-mesh.
Main Shaft Bearing Type and No.—Taper
roller.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $2\frac{3}{16}$ " x 2" x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Anchor—sliding type.

CLEARANCE

Top—.010".
Bottom—.010".
Brake Effort—Not given.

CLUTCH

Type—B. & B.
Facing Type—Moulded.
Pilot Bearing Type and No.—Durex.
Throwout Bearing Type and No.—Nice
5015-1.

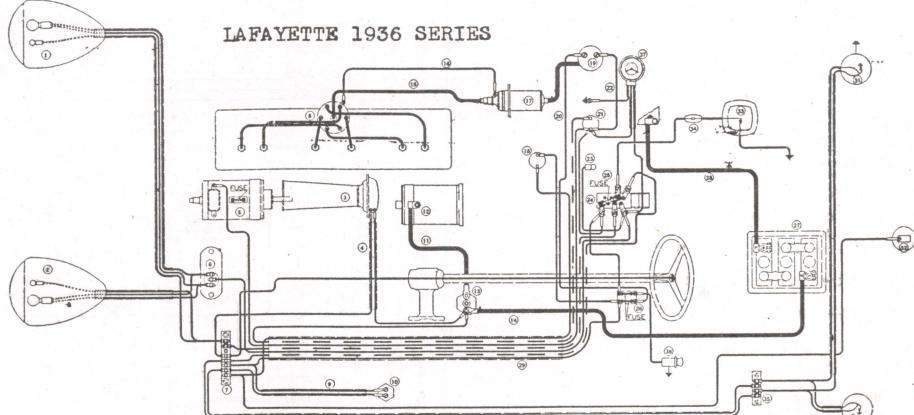
SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—U-type, threaded.

STEERING GEAR

Type—Gemmer worm and roller.
Adjustments
Column end-play, shims at bottom.
Cross-shaft, adjusting screw.
Mesh, shims on cross-shaft.
Lubricant—Steering gear lubricant.

LAFAYETTE 1936 SERIES



WIRING DIAGRAM & WIRING CHART

- | | |
|-----------------------------------|--|
| 1—Head Lamp R. H. | 18—Gasoline Gauge |
| 2—Head Lamp L. H. | 19—Ignition Switch |
| 3—Horn | 20—Ignition Switch to Fuse Block Wire |
| 4—Horn Wire Harness | 21—Ammeter |
| 5—Generator | 22—Ignition Wire to Ignition Switch Wire |
| 6—Head Lamp Foot Switch | 23—Instrument Panel Light |
| 7—Junction Block | 24—Light Switch |
| 8—Distributor | 25—Fuse |
| 9—Distributor Switch Wire Harness | 26—Fuse Block |
| 10—Stop Light Switch Wire Harness | 27—Ignition Coil |
| | 28—Battery to Ground Cable |
| | 29—Main Wiring Harness |
| | 30—Tail & Stop Light L. H. |
| | 31—Tail & Stop Light R. H. |
| | 32—Gasoline Gauge—Tank Unit |
| | 33—Dome Light |
| | 34—Dome Light Switch |
| | 35—Junction Block, Light Wire |
| | 36—Dome Stop Light Wire |
| | 37—Clock—Special Equipment |
| | 38—Cigar Lighter—Special Equipment |

Oldsmobile 6, 1938

MODEL F-38

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{7}{16}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—28.4.
Displacement—229.7 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—95 at 3400 r.p.m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—47 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other in a line through shaft centers.
Bearings—4, removable bushings.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.002"- .004".

CONNECTING RODS

End Clearance—.0055"- .0105".
Dia. Clearance—.001"- .003".

COOLING SYSTEM

Capacity—17 qts.
Pump Drive—Fan belt.
Belt Size— $32^{\circ}V$ — $44\frac{1}{16}$ " x $1\frac{1}{16}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed, babbitt-lined.
End Thrust Taken On—Front bearing.
End Clearance—.004"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter "W-1"—388S.
Type—Single downdraft.
Adjustment—With automatic transmission, idle, $\frac{1}{2}$ to 1 turn open. With standard transmission, idle, 1 to $1\frac{1}{2}$ turns open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—Dry 6 qts.
Oil Pressure—27 lbs. to 33 lbs.
Adjustment—Non-adjustable.
Oil $\begin{cases} \text{Not lower than } 32^{\circ}\text{F} & 20\text{W.} \\ \text{or S.A.E. 20.} & \\ \text{As low as } 10^{\circ}\text{F above zero.} & 20\text{W.} \\ \text{As low as } 10^{\circ}\text{F below zero.} & 10\text{W.} \\ \text{Below } 10^{\circ}\text{F below zero.} & 10\text{W. plus } 10\% \text{ kerosene.} \end{cases}$

PISTONS

Material—Alum. T-slot, oxide finish.
Clearance—Top—Land. .026" nominal.
Clearance—Bottom—.0013"- .0018".

PISTON RINGS

Gap—Comp. .007"- .014"; oil, .007"- .015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in piston.
Fit in Piston
Plain boss—.0001" loose to .0002" tight.
Lock screw boss—.0002" to .0005" tight.
Fit in Rod—.0003"- .0006".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{7}{16}$ ".
Dia. Intake— $1\frac{9}{16}$ ".
Seat Dia.— $1\frac{3}{32}$ ".
Seat Angle—Int., 30° ; exh., 45° .
Seat Width—Int., .042"- .052"; exh., .070"- .085".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.008".
Exhaust—.011".
Guides Removable—Yes.
Spring Pressure—46 lbs. at $29\frac{1}{2}$ "
94 lbs at $33\frac{1}{2}$ "
Out of engine $2\frac{1}{8}$ ".

CHASSIS

FRONT AXLE

Caster— 0° — $\frac{3}{16}^{\circ}$.
Camber— $\frac{1}{16}^{\circ}$ — $\frac{1}{16}^{\circ}$.
Toe-in— $\frac{1}{8}^{\circ}$ — $\frac{3}{16}^{\circ}$.
Kingpin Angle— 4° — $51'$ — $10''$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—N. D. Ball No. 905306 and Hyatt roller No. 107391.
Adjustment—Shims.
End Play—Not given.
Lash—.005"- .008".
Diff. Bearing Type—Hyatt barrel roller No. 127861.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—3-speed, own; automatic type optional.
Main Shaft Bearing Type and No.—N. D. Ball No. 907507 and 907506.
Countershaft Bearing Type and No.—Bushings.

BRAKES

Type—Hydraulic.
Lining Type—Primary, moulded; secondary, woven.
Lining Size— $21\frac{1}{16}$ " x $1\frac{3}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Notched adjusting screw for clearance.
Eccentric anchor pin.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—55% front, 45% rear.

CLUTCH

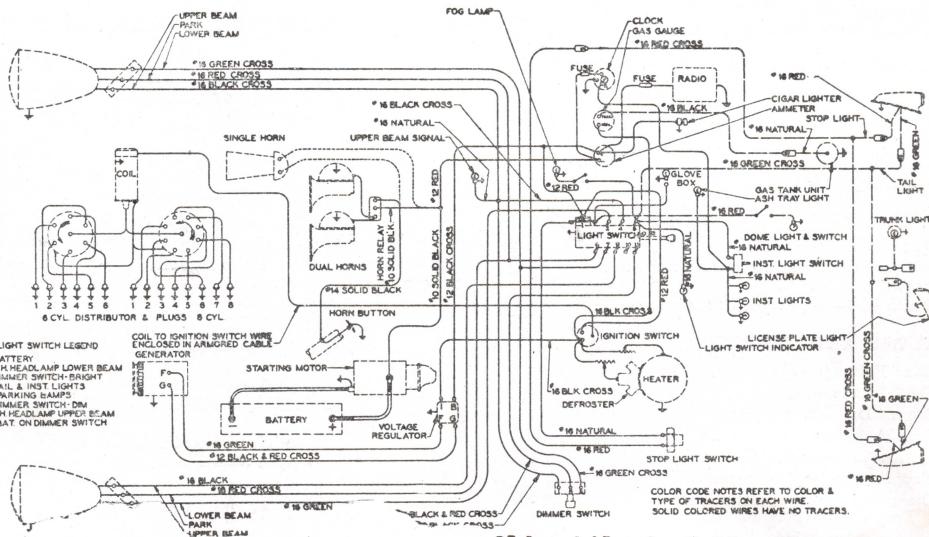
Type—B. & B. single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. Ball No. 907109.
Throwout Bearing Type and No.—Graphite.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—"U," threaded.

STEERING GEAR

Type—Saginaw worm and roller.
Adjustments—Column end play—adjusting nut at bottom.
Cross-shaft end play—adjusting screw mesh—eccentric sleeve.
Lubricant—Chassis lubricant.



Oldsmobile 8, 1938

MODEL L-38

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{3}{4}$ ".
Stroke— $3\frac{1}{8}$ ".
Taxable H. P.—33.8.
Displacement—257.1 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—110 at 3600 r.p.m.

CAMSHAFT

Drive—Link belt chain.
Chain Data—47 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—5, removable bushings.
End Thrust Taken On—Spring plunger.
Bearing Clearance—.002".-.004".

CONNECTING RODS

End Clearance—.0055".-.0105".
Dia. Clearance—.001".-.003".

COOLING SYSTEM

Capacity—21 qts.
Pump Drive—Fan belt.
Belt Size— $32^{\circ}V$ — $44\frac{1}{16}$ " x $18\frac{1}{16}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Steel-backed, babbitt-lined.
End Thrust Taken On—Front bearing.
End Clearance—.004".-.008".
Dia. Clearance—.001".-.003".

FUEL SYSTEM

Carburetor Make—Carter "WDO"—389S.
Type—Dual downdraft.
Adjustment—Idle adjustment, $\frac{1}{2}$ - $1\frac{1}{4}$ turns open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—Dry, 7 qts.
Oil Pressure—27 lbs. to 33 lbs.
Adjustment—Non-adjustable.

{ Not lower than 32° F.....	20W.
or S.A.E. 20.	
{ As low as 10° F, above 0.....	20W.
Below 10° F, below 0.....	10W.
plus 10% kerosene.	

PISTONS

Material—Alum., split skirt, oxide finish.
Clearance—Top—Land, .026" nominal.
Clearance—Bottom—.0013".-.0018".

PISTON RINGS

Gap—Comp., .009".-.014"; oil, .007".-.014".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in piston.
Fit in Piston—Plain boss—.0001" loose to .0002" tight.
Lock screw boss—.0002" loose to .0005" tight.
Fit in Rod—.0003".-.0006".

VALVES AND TAPPETS

Dia. Exhaust— $12\frac{7}{64}$ ".
Dia. Intake— $19\frac{1}{16}$ ".
Stem Dia.— $11\frac{1}{32}$ ".
Seat Angle—Int., 30°; Exh., 45°.
Seat Width—Int., .042".-.052"; Exh., .070".-.085".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.008".
Exhaust—.011".
Guides Removable—Yes.
Spring Pressure—46 lbs. at $2\frac{1}{2}$ %.
94 lbs. at $18\frac{1}{2}$ %.
Out of engine, 2 $\frac{1}{2}$ %.

CHASSIS

FRONT AXLE

Caster— 0° -. $3\frac{1}{2}$ °.
Camber— $\frac{1}{8}$ °-. 1° .
Toe-in— $\frac{1}{8}$ °-. $\frac{3}{16}$ °.
Kingpin Angle— 4° — 51° — 10° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—N. D. Ball No. 905306 and Hyatt Roller No. 107391.
Adjustment—Shims.
End Play—Not given.
Lash—.005".-.008".
Diff. Bearing Type—Hyatt barrel roller No. 127861.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Own, 3-speed; automatic type optional.
Main Shaft Bearing Type and No.—N. D. Ball No. 907507 and 907506.
Countershaft Bearing Type and No.—Bushings.

BRAKES

Type—Hydraulic.
Lining Type—Primary, moulded; secondary, woven.
Lining Size— 23.05° x $1\frac{1}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Notched adjusting screw for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—55% front, 45% rear.

CLUTCH

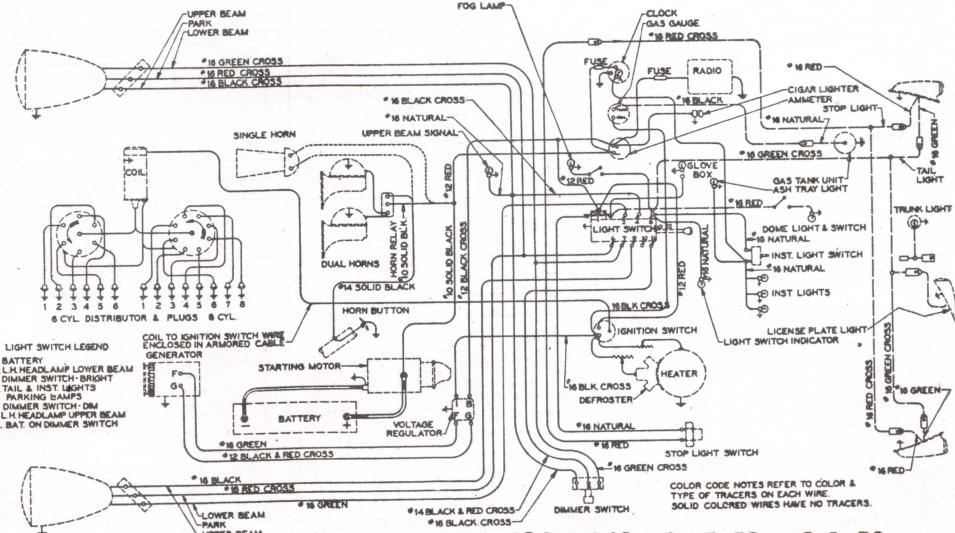
Type—B. & B. single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—N. D. Ball No. 907109.
Throwout Bearing Type and No.—Graphite.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—"U," threaded.

STEERING GEAR

Type—Saginaw worm and roller.
Adjustments—Column end play—adjusting nut at bottom.
Cross-shaft end play—adjusting screw.
Mesh—eccentric sleeve.
Lubricant—Chassis lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy—729-J.
Drive—Manual gear.
Rotation—Clockwise, from drive end.
No Load—60 amps., 5.0 volts, 6000 r.p.m.
Lock Torque—15 ft. lbs., 3.0 volts, 600 amps.
Brush Spring Tension—24-28 oz. (4 brushes).

GENERATOR

Make—Delco-Remy—936-T.
Drive—Fan belt.
Regulation—Voltage regulator.
Thermostat—Not specified.
Output, cold— $26\frac{1}{2}$ — $30\frac{1}{2}$ amps., 8 volts, 3200 r.p.m. armature.
Output, hot— $24\frac{1}{2}$ — $26\frac{1}{2}$ amps., 8 volts, 3400 r.p.m. armature.
Brush Spring Tension—Main, 22-26 oz.; 3rd brush, 16-20 oz.
Rotation—Counter-clockwise, viewed from commutator end.
Cutout to Close—7.5-8.5 volts at 9.8 m.p.h.
Amps. Discharge to Open—0-2.0 amps.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy—663-W.
Coil—Delco-Remy—539-P.
Distr. Rotation—Clockwise, viewed from top.
Breaker Gap—.015".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.030".
Spark Plug Size—14 m/m A. C., m/45— $18\frac{1}{16}$ " hex.
Manual Advance—None.
Automatic Advance— $27\frac{1}{2}$ ° max.
Vacuum Advance— 33 ° max.
Timing— 2° or .002" piston travel before top dead center with spark control in normal position.
Coil Amps., Engine Idling—2.0 amps.
Coil Amps., Engine Stopped—4.5 amps.

BATTERY

Amps.—110 amp. hr.

LAMPS

Head—No. 2320L.
Park—No. 55.
Instrument—No. 51.
Fuse—Not given.
Dome—No. 81.
Stop and Tail—No. 1154.

Oldsmobile 6, 1937

MODEL F - 37

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{7}{16}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—28.4.
Displacement—229.7 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—95 at 3400 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—47 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on center line through shafts.
Bearings—4, bronze.
End Thrust Taken On—Spring and plunger.
Bearing Clearance—.002"- .004".

CONNECTING RODS

End Clearance—.0055"- .0105".
Dia. Clearance—.001"- .003".

COOLING SYSTEM

Capacity—16 qts.
Pump Drive—Belt.
Belt Size— $44\frac{1}{16}$ " x $1\frac{3}{16}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Removable, babbitt lined.
End Thrust Taken On—Front bearing.
End Clearance—.004"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter W-1.
Type—Downdraft single.
Adjustment—Idle, $\frac{3}{4}$ - $1\frac{1}{4}$ turn open.
Other jets, fixed size.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—25 to 30 lbs.
Adjustment—Non-adjustable.
Oil $\left\{ \begin{array}{l} \text{Over } 40^\circ \text{ F. S.A.E. No. 30} \\ 30^\circ \text{ - } 80^\circ \text{ F. S.A.E. No. 20} \\ 10^\circ \text{ - } 80^\circ \text{ F. S.A.E. No. 20W} \\ -10^\circ \text{ - } 40^\circ \text{ F. S.A.E. No. 10W} \\ -30^\circ \text{ - } 20^\circ \text{ F. S.A.E. No. 10W. +} \end{array} \right.$
10% kerosene.

PISTONS

Material—Alum. alloy.
Clearance—Top—Not given.
Clearance—Bottom—.0013"- .0018"
selective.

PISTON RINGS

Gap—.009"- .014".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ " (.1235"- .1240").
No. Oil Rings—2.
Width— $\frac{3}{16}$ " (.1860"- .1865").

PISTON PINS

Type—Locked in piston.
Fit in Piston—.0002"- .0005".
Fit in Rod—.0003"- .0006".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{27}{64}$ ".
Dia. Intake— $1\frac{1}{16}$ ".
Stem Dia.—Int., .3425"- .3415"; Exh., .3415"- .3405".
Seat Angle—Int., 30° ; Exh., 45° .
Seat Width—Int., .042"- .052"; Exh., .070"- .085".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.008".
Exhaust—.011".
Guides Removable—Yes.
Spring Pressure
46 lbs. at $2\frac{9}{32}$ ", valve closed.
94 lbs. at $2\frac{1}{32}$ ", valve open.

CHASSIS

FRONT AXLE

Caster— $\frac{1}{4}^\circ$ - 1° .
Camber— $\frac{1}{8}^\circ$ - 1° .
Toe-in— $\frac{1}{8}^\circ$ - $\frac{3}{16}^\circ$.
Kingpin Angle— 4° - $51'$ - $10''$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Double ball and str. roller.
Adjustment—Shims.
End Play—Not given.
Lash—Not given.
Diff. Bearing Type—Hyatt roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.

TRANSMISSION

Make and Type—Synchro-mesh, helical gears.
Main Shaft Bearing Type and No.—ND ball No. 954144 and 907506.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Bendix hydraulic.
Lining Type—Primary moulded; secondary woven and compressed.
Lining Size—Primary $91\frac{1}{2}$ "; secondary $11\frac{1}{2}\frac{1}{2}$ " x $1\frac{3}{4}^\circ$ $\frac{3}{16}^\circ$.
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Eccentric anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—54.5% front; 45.5% rear.

CLUTCH

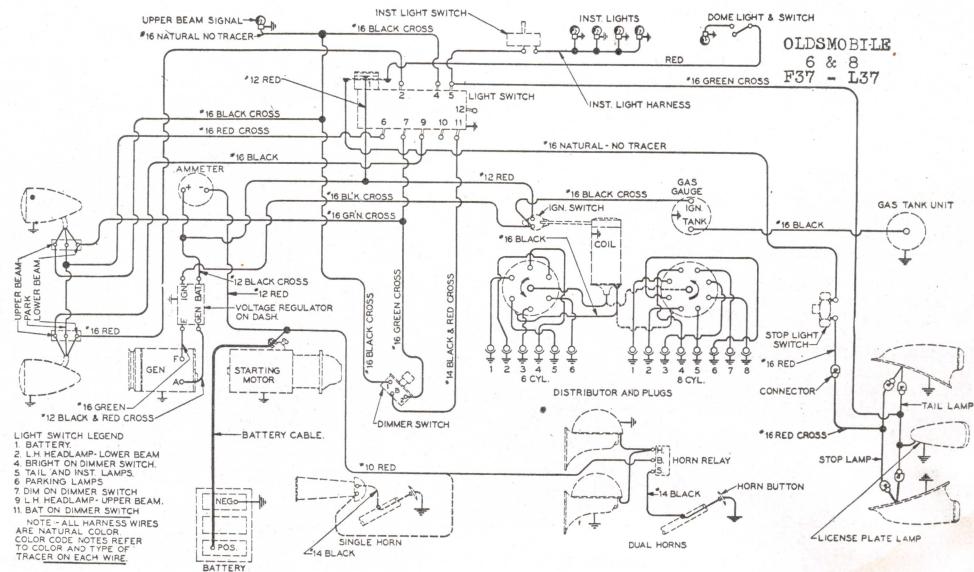
Type—B. & B. No. 9A6—9" single plate.
Facing Type—Moulded woven.
Pilot Bearing Type and No.—Ball No. 907109.
Throwout Bearing Type and No.—Graphite.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Saginaw worm and roller.
Adjustments—Column end play—adjusting screw at bottom.
Cross-shaft—adjusting screw.
Mesh—eccentric, adjustor at bottom.
Lubricant— $\frac{1}{2}$ lb. chassis lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 739G.
Drive—Over-running clutch.
Rotation—Clockwise, from drive end.
No Load—65 amps, 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.61 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 936-T.
Drive—Fan belt.
Regulation—External voltage control.
Thermostat—Not given.
Output, cold—22-26 amps. at 8.4 to 8.8 volts, 3300 r.p.m.
Output, hot—20-24 amps. at 8.4 to 8.8 volts.
Brush Spring Tension—Main 22-26 oz.; Third brush 16-20 oz.
Rotation—Counter-clockwise, viewed from commutator end.
Cutout to Close—6.5-7.25 volts.
Amps. Discharge to Open—3.0 max.
Field Fuse—Not given.

IGNITION

Distributor—Delco-Remy 647-F.
Coil—Delco-Remy 540-P.
Distr. Rotation—Clockwise, viewed from top.
Breaker Gap—.020".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.040".
Spark Plug Size—A. C. "K-9," 14 m/m.
Manual Advance—Full automatic.
Automatic Adv.— 26° max. at 3800 r.p.m.
Vacuum Adv.— 20° max. at 1200 r.p.m.
Timing—Top dead center.
Coil Amps., Engine Idling—4.5.
Coil Amps., Engine Stopped—2.0.

BATTERY

Amps.—94 amp. hr.

LAMPS

Head—No. 2320.
Park—No. 55.
Instrument—No. 55.
Fuse—Not given.
Dome—No. 81.
Stop and Tail—No. 1154.

Oldsmobile 8, 1937

MODEL L-37

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{4}$ ".
Stroke— $3\frac{1}{8}$ ".
Taxable H. P.—33.8.
Displacement—257.1 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—110 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—47 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on centerline through shafts.
Bearings—5, Bronze.
End Thrust Taken On—Spring and plunger.
Bearing Clearance—.002"-".004".

CONNECTING RODS

End Clearance—.0055"-".0105".
Dia. Clearance—.001"-".003".

COOLING SYSTEM

Capacity—20 qts.
Pump Drive—Belt.
Belt Size— $4\frac{11}{16}$ " x $1\frac{13}{16}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Removable, babbitt lined.
End Thrust Taken On—Front bearing.
End Clearance—.004"-".008".
Dia. Clearance—.001"-".003".

FUEL SYSTEM

Carburetor Make—Carter WD-O.
Type—Downdraft, dual.
Adjustment—Idle $\frac{3}{4}$ — $1\frac{1}{4}$ turn open. Other jets fixed size.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—25-30 lbs.
Adjustment—Non-adjustable.
Oil
Over 40° F..... S.A.E. No. 30
30°-80° F..... S.A.E. No. 20
10°-80° F..... S.A.E. No. 20W.
-10°-40° F..... S.A.E. No. 10W.
-30°-20° F..... S.A.E. No. 10W. plus
10% kerosene.

PISTONS

Material—Alum. alloy.
Clearance—Top—Not given.
Clearance—Bottom—.0013"-".0018"
selective.

PISTON RINGS

Gap—.009"-".014".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ " (.1235"-".1240").
No. Oil Rings—2.
Width— $\frac{3}{16}$ " (.1860"-".1865").

PISTON PINS

Type—Locked in piston.
Fit in Piston—.0002"-".0005".
Fit in Rod—.0003"-".0006".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{27}{64}$ ".
Dia. Intake— $1\frac{9}{16}$ ".
Stem Dia.—Int. .3425"—.3415" Exh. .3415"—.3405".
Seat Angle—Int. 30°; Exh. 45°.
Seat Width—Int. .042"—".052"; Exh. .070"—".085".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.008".
Exhaust—.011".
Guides Removable—Yes.
Spring Pressure—
46 lbs. at $2\frac{9}{32}$ " valve closed.
94 lbs. at $2\frac{1}{32}$ " valve open.

CHASSIS

FRONT AXLE

Caster— $\frac{1}{4}$ °- $\frac{1}{2}$ °.
Camber— $\frac{1}{8}$ °- $\frac{1}{2}$ °.
Toe-in— $\frac{1}{8}$ "-. $\frac{1}{16}$ ".
Kingpin Angle—4°-51°-10".
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Double ball and str. roller.
Adjustment—Shims.
End Play—Not given.
Lash—Not given.
Diff. Bearing Type—Hyatt roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ lbs.

TRANSMISSION

Make and Type—Synchro mesh, helical gears.
Main Shaft Bearing Type and No.—N. D. Ball Nos. 954144 and 907506.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Bendix hydraulic.
Lining Type—Primary moulded; secondary woven and compressed.
Lining Size—Primary Shoe $10\frac{5}{8}$ "x $1\frac{3}{4}$ "x $\frac{3}{16}$ ".
Secondary Shoe $12\frac{1}{4}$ "x $1\frac{3}{4}$ "x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing; Adjusting screw for clearance; Eccentric anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—54.5% front; 45.5% rear.

CLUTCH

Type—B. & B. No. 10A7—10" single plate.
Facing Type—Moulded woven.
Pilot Bearing Type and No.—
Ball No. 907109.
Throwout Bearing Type and No.—Graphite.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Saginaw worm and roller.
Adjustments—
Column end play—adjusting screw at bottom.
Cross shaft—adjusting screw.
Mesh—eccentric adjustment at bottom.
Lubricant— $\frac{1}{2}$ lb. chassis lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 729-J.
Drive—Over-running clutch.
Rotation—Clockwise from drive end.
No Load—60 amps., 5 volts, 6000 r.p.m.
Lock Torque—15 ft. lbs., 600 amps., 3.0 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 936-T.
Drive—Fan belt.
Regulation—External voltage control.
Thermostat—None.
Output, cold—22-26 amps., 8.4-8.8 volts.
Output, hot—20-24 amps., 8.4-8.8 volts.
Brush Spr. Tension—Main 22-26 oz.; Third brush 16-20 oz.
Rotation—Counter-clockwise viewed from commutator end.
Cutout to close—6.5-7.25 volts.
Amps. Discharge to Open—3.0 max.
Field Fuse—None.

IGNITION

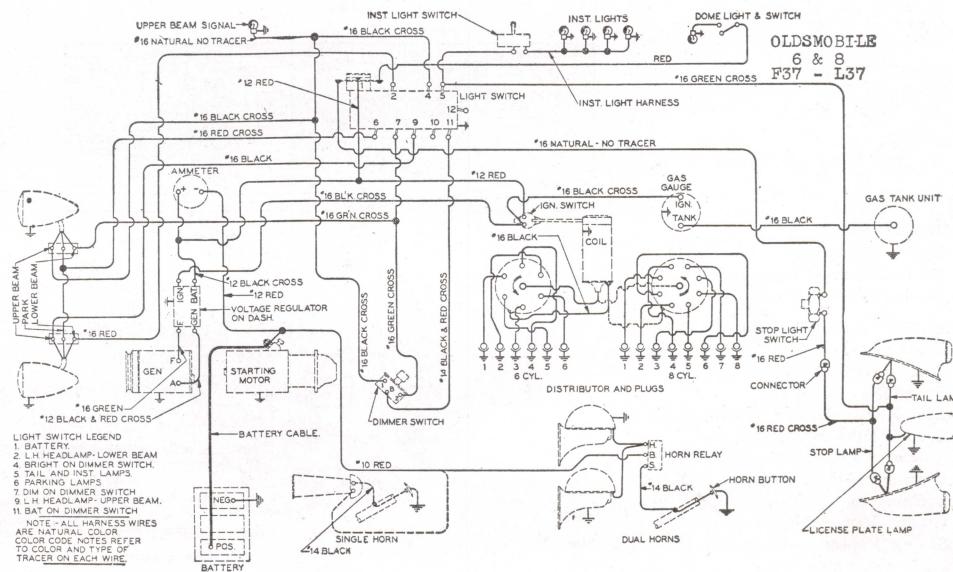
Distributor—Delco-Remy 663-W.
Coil—Delco-Remy 539-P.
Distr. Rotation—Clockwise, viewed from top.
Breaker Gap—.015".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.030".
Spark Plug Size—A. C. "K-9" 14 m/m.
Manual Advance—Full automatic.
Automatic Adv.—28° max. at 4000 r.p.m.
Vacuum Adv.—15° max. at 1200 r.p.m.
Timing—2° or .002" piston travel before top dead center.
Coil Amps., Engine Idling—4.5.
Coil Amps., Engine Stopped—2.0.

BATTERY

Amps.—110 amp. hr.

LAMPS

Head—No. 2320.
Park—No. 55.
Instrument—No. 55.
Fuse—None.
Dome—No. 81.
Stop and Tail—No. 1154.



Packard 6, 1938

SERIES 1600

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—29.4.
Displacement—245.34 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—100 at 3600 r.p.m.

CAMSHAFT

Drive—Morse No. 1866 RX.
Chain Data—58 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line between shaft centers.
Bearings—4, steel-backed babbitt.
End Thrust Taken On—Thrust plate, front end. End play .002"- .004".
Bearing Clearance—.001"- .003".

CONNECTING RODS

End Clearance—.004"- .010".
Dia. Clearance—.0005"- .0015".

COOLING SYSTEM

Capacity— $3\frac{3}{4}$ gals.
Pump Drive—Fan belt.
Belt Size— 42° V, $4\frac{1}{4}$ " O. D. x $\frac{3}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt-lined, steel shell.
End Thrust Taken On—Front bearing.
End Clearance—.003"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Chandler-Groves.
Type—Single, downdraft.
Adjustment—Turn in to lean, out to enrich mixture; approx. adjustment, $\frac{1}{8}$ turn open.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—35 lbs., normal driving speed.
Adjustment—Non-adjustable.

Oil	Below -10° F.....	S.A.E. 10W.
	plus 10% kerosene.	
	+ 10° F.....	S.A.E. 10W.
	+ 10° F.....	S.A.E. 20W.
+ 32° F.....	S.A.E. 30	
Average 90° F.....	S.A.E. 40	

PISTONS

Material—Autothermic alum., with strut.
Clearance—Top—Not specified.
Clearance—Bottom—.0015".

PISTON RINGS

Gap—All rings .007"- .015".
No. Comp. Rings—2, Perfect Circle No. 70.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1 Perfect Circle No. X90-85.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Finger push fit, 160° F.
Fit in Rod—Size to size.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{8}\frac{1}{2}$ ".
Dia. Intake—1.575".
Stem Dia.—.34025".
Seat Angle—Int., 30° ; Exh., 45° .
Seat Width—Not specified.
Tappet Type—Mushroom.
Clearance—Hot: Intake—.007".
Exhaust—.010".
Guides Removable—Yes.
Spring Pressure—50 lbs. at $1\frac{5}{8}$ ".
120 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}^{\circ}$ + - $\frac{1}{2}^{\circ}$.
Camber— $\frac{1}{2}^{\circ}$ + - $\frac{1}{2}^{\circ}$.
Toe-in—0 + $\frac{1}{16}$ - 0.
Kingpin Angle— 1° -.54'.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Timken 3879-3820A and 3776A-3735.
Adjustment—Thread.
End Play—5 to 6 lbs. pull on 5" wrench.
Lash—.003"- .005".
Diff. Bearing Type—Timken 2984-2924.
Adjustment—Thread.
End Play—.010"- .012" spread.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Own, silent, synchronized.
Main Shaft Bearing Type and No.—MRC 209CFG and 306SG.
Countershaft Bearing Type and No.—Not specified.

BRAKES

Type—Bendix, two-shoe hydraulic.
Lining Type—Primary, No. 714 U. S.; secondary, No. 589 U. S.
Lining Size—12" x $1\frac{1}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Notched wheel for clearance.
Sliding type anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Single dry plate.
Facing Type—U. S. No. 733, woven.
Pilot Bearing Type and No.—MRC No. 7109.
Throwout Bearing Type and No.—Ball.

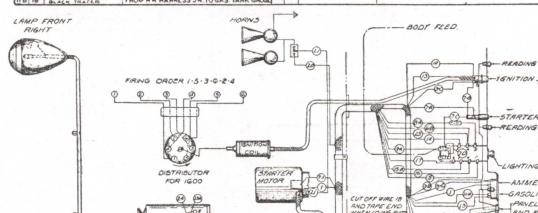
SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Rubber—bushed.

STEERING GEAR

Type—Worm and double roller tooth.
Adjustments
Column end play—shims top cover.
Cross-shaft end play—adjusting screw.
Mesh—shims on cross-shaft.
Lubricant—Summer, S.A.E. 160; Winter, S.A.E. 90—11 oz.

NO. GA.	COLOR	LOCATION	NO. GA.	COLOR	LOCATION
1. 10 RED		FROM STARTER SWITCH TO AMMETER	13. 16 BLACK		FROM GLOW PLUGS TO GASOLINE GAUGE
3A. 10 RED		FROM CURRENT REGULATOR TO GENERATOR	14. 16 BLACK		FROM LIGHTING SW TO LAMP FRONT RT. (CIT)
3B. 10 BLACK		FROM CURRENT REGULATOR TO AMMETER	15A. 14 WHITE		FROM DIMMER SW TO LAMP FRONT LT. (CIT)
3C. 10 BLACK		FROM CURRENT REGULATOR TO VOLTAGE REGULATOR	15B. 14 WHITE		FROM DIMMER SW TO LAMP FRONT LT. (CIT)
5. 14 BLACK		FROM LIGHTING SWITCH TO DIMMER SWITCH	16. 14 GREEN		FROM LIGHTING SW TO LAMP FRONT RT. (CIT)
6A. 14 YELLOW		FROM DIMMER SWITCH TO LAMP FRONT RT.	17. 16 BLACK WITH RED TRAC		FROM LIGHTING SW TO LAMP FRONT LT. (CIT)
6B. 14 BLACK		FROM DIMMER SWITCH TO LAMP FRONT LT.	18. 16 BLACK		FROM LIGHTING SW TO LAMP FRONT LT. (CIT)
7A. 16 BLACK		FROM STARTER BUTT TO STARTER MOT. SW.	20. 16 BLACK		FROM STEERING POST HORN BUTT TO HORN BELT
7B. 16 BLACK		FROM STARTER BUTT TO LIGHTING SWITCH	21. 16 GREEN		FROM VOLTAGE REGULATOR TO GENERATOR
7C. 12 BLACK		FROM STARTER BUTT TO STOP LIGHT SW.	22. 16 GREEN		FROM VOLTAGE REGULATOR TO GENERATOR
7D. 12 BLACK		FROM PANEL PHOTOSTAT TO FUSE TO LIGHT SW.	24. 16 BROWN		FROM VOLTAGE REGULATOR TO GENERATOR
8A. 16 BLACK		FROM IR HARNESS 53 TO REAR LAMPS	25. 16 WHITE		FROM LIGHTING SW TO SPEEDOMETER LIGHT
8B. 16 BLACK		FROM IR HARNESS 53 TO REAR LAMPS			
8C. 16 GREEN		FROM IR HARNESS 53 TO STOP LIGHT SW.			
8D. 16 GREEN		FROM IR HARNESS 53 TO STOP LIGHT SW.			
9B. 16 GREEN		FROM IR HARNESS 53 TO GAS TANK GAUGE			



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 739F.
Drive—Bendix.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5.0 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 525 amps., 3.4 volt.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy No. 110000S.
Drive—Belt.
Regulation—Delco-Remy voltage regulator No. 5827.
Thermostat—None.
Output, cold—28.3 amps., 8 volts.
Output, hot—26.5 amps., 8 volts.
Brush Spring Tension—22-26 oz., main; 16-20 third brush.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.5 to 7.25 volts.
Amps. Discharge to Open—3.0 amps. max.
Field Fuse—None.

IGNITION

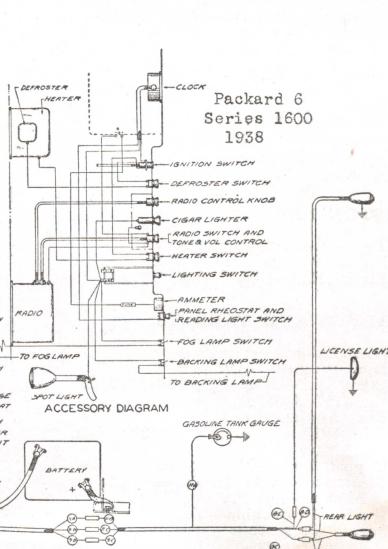
Distributor—Delco-Remy 647E.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise from above.
Breaker Gap—.018"- .022".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025"- .0305".
Spark Plug Size—10 m/m No. 103 A. C., or Y4 Champion.
Manual Advance—None.
Automatic Adv.—Full automatic.
Timing— 6° before top dead center.
Coil Amps., Engine Idling—0.5 amp.
Coil Amps., Engine Stopped—2.5 amp.

BATTERY

Amps.—95 amp. hr.

LAMPS

Head—2330L (right), 1104 (left lamp).
Park—No. 55.
Instrument—No. 55.
Fuse—25 volts, 20 amps.
Dome—No. 81.
Stop and Tail—No. 1158.



Packard 8, 1938

SERIES 1601, 1602

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—33.8.
Displacement—282.05 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max H. P.—120 at 3800 r.p.m.

CAMSHAFT

Drive—Morse No. 1866 RX.
Chain Data—58 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—5, steel-backed babbitt.
End Thrust Taken On—Thrust plate, front end.
End play, .002"-0.004".
Bearing Clearance—.001"-0.003".

CONNECTING RODS

End Clearance—.004"-0.010".
Dia. Clearance—.0005"-0.0015".

COOLING SYSTEM

Capacity—4 gals.
Pump Drive—Fan belt.
Belt Size— 42°F — $49\frac{1}{4}$ " O.D. x $\frac{3}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Babbitt-lined, steel shell.
End Thrust Taken On—Center bearing.
End Clearance—.003"-0.008".
Dia. Clearance—.001"-0.003".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Duplex, downdraft.
Adjustment—Turn in to lean, or out to enrich mixture.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—35 lbs. normal driving speed.
Adjustment—Non-adjustable.

Oil	Below -10°F	S.A.E. 10W.
	-10°F	S.A.E. 10W.
	plus 10% kerosene.	S.A.E. 20W.

$+10^{\circ}\text{F}$	S.A.E. 30
$+32^{\circ}\text{F}$	S.A.E. 40
Average 90°F	S.A.E. 40

PISTONS

Material—Autothermic alum., with strut.
Clearance—Top—Not specified.
Clearance—Bottom—.0015".

PISTON RINGS

Gap—All rings .007"-0.015".
No. Comp. Rings—2 Perfect Circle No. 70.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1 Perfect Circle X90-85.
Width— $\frac{1}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Finger push fit 160°F .
Fit in Rod—Size to size.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{32}$ ".
Dia. Intake— $1\frac{1}{32}$ ".
Seat Dia.—.34025".
Seat Angle—Int., 30° ; Exh., 45° .
Seat Width—Not given.
Tappet Type—Mushroom.
Clearance—Hot: Intake—.007".
Exhaust—.010".
Guides Removable—Yes.
Spring Pressure—50 lbs. at $1\frac{5}{8}$ ".
120 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}^{\circ}$ + $-\frac{1}{2}^{\circ}$.
Camber— $\frac{1}{2}^{\circ}$ + $-\frac{1}{2}^{\circ}$.
Toe-in—0 + $\frac{1}{16}$ ".
Kingpin Angle— $1^{\circ}54'$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, hypoid.
Pinion Bearing Type—Timken 3879-3820A and 3776A-3735.
Adjustment—Thread.
End Play—5 to 6 lbs pull, 5" wrench.
Lash—.003"-0.005".
Diff. Bearing Type—Timken 2984-2924.
Adjustment—Thread.
End Play—.010" spread.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Own, synchronized.
Main Shaft Bearing Type and No.—MRC 209 CFG and 306 SG.
Countershaft Bearing Type and No.—Not specified.

BRAKES

Type—Bendix, two-shoe hydraulic.
Lining Type—Primary, No. 451 Raybestos; secondary, No. 589F, U.S.
Lining Size—1601, $1\frac{3}{4}^{\circ}$ " x $\frac{3}{16}$ " x 13".
1601A and 1602, $2\frac{1}{4}^{\circ}$ " x $\frac{3}{16}$ " x 13".
Adjustments—Eccentric for centralizing.
Notched wheel for clearance.
Sliding type anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Single dry plate.
Facing Type—U. S. No. 733, woven.
Pilot Bearing Type and No.—MRC No. 7109.
Throwout Bearing Type and No.—Ball.

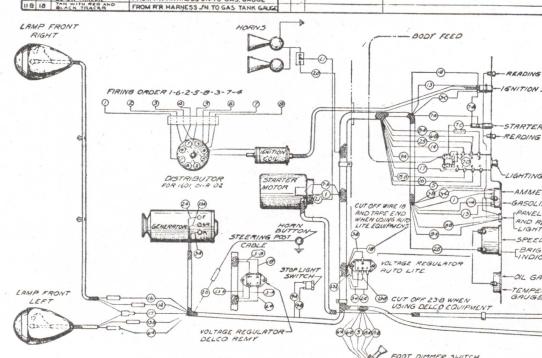
SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Rubber bushed.

STEERING GEAR

Type—Own, worm and double-tooth roller.
Adjustments—Column end play—shims top cover.
Cross-shaft end play—adjusting screw.
Mesh—shims on cross-shaft.
Lubricant—Summer, S.A.E. 160; Winter, S.A.E. No. 90—11 oz.

NO	GA	COLOR	LOCATION	NO	GA	COLOR	LOCATION
1	10	RED	FROM STARTER MOTOR SW TO DYNAMO	13	16	BLACK	FROM IGNITION SWITCH TO GASOLINE GAUGE
2	10	RED	FROM CURRENT REGULATOR TO DYNAMO	14	16	BLACK	FROM DYNAMO SW TO AMP FRONT LT
3	10	BLACK	FROM CURRENT REGULATOR TO AMMETER	15	16	WHITE	FROM DYNAMO SW TO LIGHTING SWITCH
4	10	RED	FROM DYNAMO SW TO DASH METER	16	16	WHITE	FROM DYNAMO SW TO LIGHTING SWITCH
5	14	BLACK	FROM LIGHTING SWITCH TO DASH METER	17	16	GREEN	FROM DYNAMO SW TO LIGHTING SWITCH
6	14	YELLOW	FROM DYNAMOSWITCH TO LAMP PT. CTR	18	16	BLACK	FROM DYNAMO SW TO LIGHTING SWITCH
7	14	WHITE	FROM DYNAMO SW TO LAMP PT. CTR	19	16	BLACK	FROM DYNAMO SW TO LIGHTING SWITCH
7A	16	BLACK	FROM STARTER BUTT TO STARTER MOT. SW	20	16	BLACK	FROM STEERING POST HORN BUTT TO HORN RELAY
8	16	BLACK	FROM STARTER BUTT TO LIGHTING SWITCH	21	12	BLACK	FROM STARTER MOTOR SW TO LIGHT RELAY
8A	16	BLACK	FROM PANEL RHEOSTAT TO FUSE TO LIGHT SW	22	12	BLACK	FROM LIGHTING SW TO LIGHTING RELAY
9	16	BLACK	FROM R HARNESS JN TO REAR LAMPS	23	18	BROWN	FROM VOLTAGE REGULATOR TO GENERATOR
9A	16	GREEN	FROM R HARNESS JN TO STOP LIGHT	24	18	WHITE	FROM LIGHTING SW TO SHADOW BRIGHT LIGHT INC
9C	16	GREEN	FROM R HARNESS JN TO TURN SIGNAL	25	18	WHITE	FROM LIGHTING SW TO SHADOW BRIGHT LIGHT INC
10	16	BLACK	FROM R HARNESS JN TO GAS TANK GAGE				



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MAX—4006.
Drive—Bendix.
Rotation—Clockwise, viewing drive end.
No. Load—With drive, 65 amps., 5.5 volts, 5300 r.p.m. min.
Lock Torque—16 ft. lbs., 600 amps., 2.7 volts.
Brush Spring Tension—31.42 oz., with new brushes.

GENERATOR

Make—Auto-Lite—GCJ—4807-A-2.
Drive—Belt.
Regulation—Auto-Lite voltage regulator VRD—4001-A.
Thermostat—None.
Output, cold— $30\frac{1}{2}$ amps., 8 volts.
Output, hot— $25\frac{1}{2}$ amps., 8 volts.
Brush Spring Tension—27.53 oz., with new brushes.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 to 7.5 volts.
Amps. Discharge to Open—None.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite—IGT—4007.
Coil—Auto-Lite—CE 4628.
Distr. Rotation—Counter-clockwise, viewed from top.
Breaker Gap—.0125"—.0175".
Brush Spring Tension—19.23 oz.
Spark Plug Gap—.0255"—.0305".
Spark Plug Size—10 m/m No. 103 A. C., or No. Y4 Champion.
Manual Advance—None.
Automatic Advance—Full automatic.
Timing— 8° before top dead center.
 $2\frac{3}{4}^{\circ}$ — 4° before top dead center, high compression head.
Coil Amps., Engine Idling—0.5 amp.
Coil Amps., Engine Stopped—2.5 amp.

BATTERY

Amps.—114 amp. hr.

LAMPS

Head—2330L (right), 1104 (left lamp).
Park—No. 55.
Instrument—No. 55.
Fuse—25 volt, 20 amp.
Dome—No. 81.
Stop and Tail—No. 1158.

Packard 12, 1938

SERIES 1607, 1608

ENGINE

DATA

No. of Cylinders—12 (two blocks at 67° angle).
 Bore— $3\frac{7}{16}$ ".
 Stroke— $4\frac{1}{4}$ ".
 Taxable H. P.—56.7.
 Displacement—473.0 cu. in.
 Firing Order—1R-6L-5R-2L-3R-4L-6R-1L-2R-5L-4R-3L.
 Max H. P.—175 at 3200 r.p.m.

CAMSHAFT

Drive—Morse No. 1866N, chain.
 Chain Data—56 links, $1\frac{3}{4}$ " wide, $\frac{1}{2}$ " pitch.
 Valve Timing—Sprocket marks opposite each other on line through shaft centers.
 Bearings—4, steel-backed babbitt.
 End Thrust Taken On—Front end.
 End play, .002"-.006".
 Bearing Clearance—Nos. 1 and 4, .001"-.0015".
 Nos. 2 and 3, .002"-.0025".

CONNECTING RODS

End Clearance—.008"-.010".
 Dia. Clearance—.001"-.0015".

COOLING SYSTEM

Capacity—10 gals.
 Pump Drive—Fan belt.
 Belt Size—Dual 47°V, 50 $\frac{1}{2}$ " O.D. x $\frac{3}{4}$ ".
 Belt Adjustment—Generator mounting.
 Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
 Material—Babbitt lined, steel shell.
 End Thrust Taken On—Front bearing.
 End Clearance—.003"-.005".
 Dia. Clearance—.001"-.002".

FUEL SYSTEM

Carburetor Make—Stromberg.
 Type—Duplex downdraft.
 Adjustment—Turn in to lean; out to enrich mixture.
 Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
 Pump Type—Gear.
 Capacity—10 qts.
 Oil Pressure—50 lbs. normal driving speed.
 Adjustment—Thread.

Oil	Below -10° F.....	S.A.E. 10W.	LOC 251 GREEN	LOCATION FROM STARTER MOTOR SWITCH TO AMMETER
	plus 10% kerosene.		252 GREEN	FROM GENERATOR RELAY TO GAUGE TO STOP LIGHT
	-10° F.....	S.A.E. 10W.	253 GREEN	STOP LIGHT TO SOLID STATE REAR BRAKE
	+10% F.....	S.A.E. 20W.	254 GREEN	STOP — FEED TO SPLICE A

	$+32^{\circ}$ F.....	S.A.E. 30W.	255 GREEN	REAR BRAKE JUNCTION TO REAR BRAKE
	Average 90° F.....	S.A.E. 40	256 GREEN	BACKING LIGHT SWITCH TO SPLICE D

PISTONS

Material—Autothermic alum., with strut.
 Clearance—Top—Not specified.
 Clearance—Bottom—.0015".

PISTON RINGS

Gap—All rings .007"-.015".
 No. Comp. Rings—3.
 Width—1 Perfect Circle No. 200; 2 Perfect Circle No. 70, $\frac{1}{8}$ " wide.
 No. Oil Rings—1.
 Width—Perfect Circle No. X90-85—.155" wide.

PISTON PINS

Type—Floating.
 Fit in Piston—Finger push fit at 160° F.
 Fit in Rod—Size to size.

VALVES AND TAPPETS

Dia. Exhaust— $12\frac{1}{2}$ ".
 Dia. Intake— $14\frac{1}{2}$ ".
 Stem Dia.—Int. .3405"; Exh. .338".
 Seat Angle— 45° .
 Seat Width—Not specified.
 Tappet Type—Roller and lever.
 Clearance—Hot: Intake—Automatic take-up.
 Exhaust—Automatic take-up.
 Guides Removable—Yes.
 Spring Pressure—70 lbs. at $27\frac{1}{2}$ ".
 145 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $0^{\circ} + 0^{\circ} - \frac{1}{2}^{\circ}$.
 Camber— $1^{\circ} + -\frac{1}{4}^{\circ}$.
 Toe-in— $\frac{1}{16}^{\circ} + \frac{1}{16}^{\circ} - 0^{\circ}$.
 Kingpin Angle— $1^{\circ} - 30^{\circ}$.
 Tie Rod Adj.—Thread.

REAR AXLE

Type—Angle set semi-floating, hypoid.
 Pinion Bearing Type—MRC 5309 and 5304.
 Adjustment—Shims.
 End Play—Not given.
 Lash—.003"-.005".
 Diff. Bearing Type—Timken 469-452.
 Adjustment—Thread.
 End Play—.015" spread.
 Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Own, silent, synchronized.
 Main Shaft Bearing Type and No.—MRC 211-6AG and 307-6AG.
 Countershaft Bearing Type and No.—Not given.

BRAKES

Type—Bendix two-shoe, hydraulic.
 Lining Type—Primary, 451 Raybestos; secondary, No. 589 U.S.
 Lining Size— $15^{\prime\prime} \times 2\frac{3}{4}^{\prime\prime} \times \frac{1}{4}^{\prime\prime}$.
 Adjustments—Eccentric for centralizing.
 Notch wheel for clearance.
 Sliding type anchor.
 Clearance—Top—.010".
 Bottom—.010".
 Brake Effort—50-50.

CLUTCH

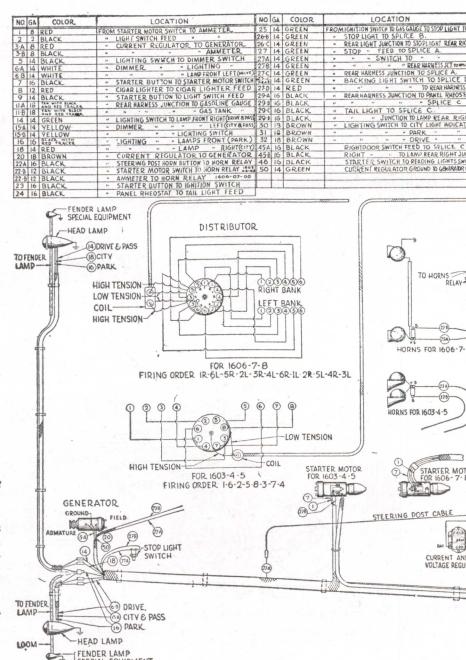
Type—Single plate with vacuum booster.
 Facing Type—Hyco DB 3903 PDX.
 Pilot Bearing Type and No.—MRC 205SF.
 Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
 Type Rear—Semi-elliptic.
 Shackle Adjustment—Threaded and rubber bushing.

STEERING GEAR

Type—Own, worm and double-tooth roller.
 Adjustments—Column end play—shims top cover.
 Cross-shaft end play—none.
 Mesh—Cross-shaft adjusting screw.
 Lubricant—Summer, S.A.E. 160; Winter, S.A.E. 90 (3/4 pint).



Packard 6, 1937

MODEL 115-C

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{16}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H.P.—28.36.
Displacement—237.0 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H.P.—100 @ 3600 r.p.m.

CAMSHAFT

Drive—Morse 1866 RX chain.
Chain Data—58 links, $1\frac{1}{4}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—4, replaceable.
End Thrust Taken On—Thrust plate front end. End clearance .002"- .004".
Bearing Clearance—.001"- .003".

CONNECTING RODS

End Clearance—.004"- .010".
Dia. Clearance—.0015".

COOLING SYSTEM

Capacity— $4\frac{1}{4}$ gal.
Pump Drive—Fan belt.
Belt Size— $42^{\prime \prime} \times 43^{\prime \prime} \times \frac{3}{4}^{\prime \prime}$.
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt lined steel shell.
End Thrust Taken On—Front Bearing.
End Clearance—.003"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Chandler and Groves "AOC-2".
Type—Downdraft single.
Adjustment—Idle adjustment only $\frac{1}{8}$ turn open.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—35 lbs. at normal driving (30 m.p.h.).
Adjustment—Non-adjustable.

Oil	90°F and over, S. A. E. 40.
	40°F and over, S. A. E. 30.
	25°F to 85°F , S. A. E. 20 or 20-W.

10°F to 85°F , S. A. E. 20-W.	10°F to 45°F , S. A. E. 10-W.
	Below 10°F , S. A. E. 10-W. + 10% Kerosene.

PISTONS

Material—Alum. Alloy with strut.
Clearance—.0015" 12-18 lbs. pull.

PISTON RINGS

Gap—Comp. .007"- .012"; Oil, .007"- .015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Finger push fit at 160°F .
Fit in Rod—Min. .00025" push fit room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1.406^{\prime \prime}$.
Dia. Intake— $1.575^{\prime \prime}$.
Stem Dia.— $.340^{\prime \prime}$.
Seat Angle—Int. 30° , Exh. 45° .
Seat Width—Not given.
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.007".
Exhaust—.010".
Guides Removable—Yes.
Spring Pressure—40 lbs. @ 15°C .
110 lbs valve open.

CHASSIS

FRONT AXLE

Caster— $2\frac{1}{4}^{\circ}$ + or — $\frac{1}{2}^{\circ}$.
Camber— 1° + or — $\frac{1}{4}^{\circ}$.
Toe-in— $\frac{1}{32}^{\prime \prime}$ — $\frac{1}{8}^{\prime \prime}$.
Kingpin Angle— $1^{\circ}30'$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—25 to 30 inch pounds pre-load drag.
Lash—.003"—.005".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—.010" spread.
Lubricant Capacity—Housing—5 pts.

TRANSMISSION

Make and Type—3 speed helical, Synchromesh.
Main Shaft Bearing Type and No.—MRC-209CFG and 306SG.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Hydraulic (Bendix).
Lining Type—Not specified.
Lining size— $13^{\prime \prime} \times 1\frac{3}{4}^{\prime \prime} \times \frac{3}{16}^{\prime \prime}$ per shoe.
Adjustments—Eccentric for centralizing;
Adjusting screw for clearance;
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—MRC-7109.
Throwout Bearing Type and No.—Ball.

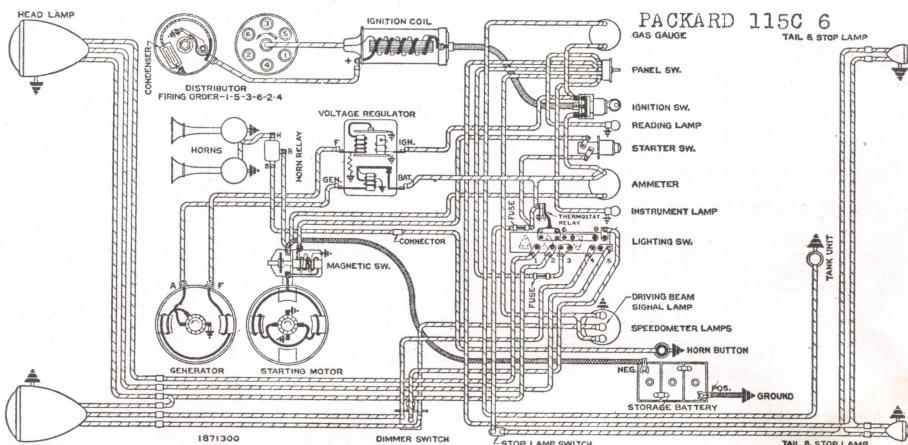
SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Worm and double tooth roller.
Adjustments—Column end play—shims under worm cover; Cross shaft end play;
adjusting screw; Mesh shims on cross shaft.

Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 739F.
Drive—Bendix drive.
Rotation—Clockwise viewing pinion.
No Load—65 amps, 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.6 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 948U.
Drive—Belt.
Regulation—Voltage regulation.
Thermostat—None.
Output, cold—22 amps. at 8 volts at 3000 r.p.m.
Output, hot—18 amps. at 8 volts at 3500 r.p.m.
Brush Spr. Tension—Main 22-26 oz.; Third brush 16-20 oz.
Rotation—Clockwise viewing drive end.
Cutout to close— $6\frac{1}{2}$ to 7 volts.
Amps. Discharge to Open—3 max.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 647E.
Coil—Delco-Remy 539N.
Distr. Rotation—Clockwise viewing drive end.
Breaker Gap—.0125"—.0175".
Brush Spr. Tension—19-23 oz.
Sp. Plug Gap—A. C. or Champion 10 m/m "Y4."
Sp. Plug Size—.028"—.030".
Manual Advance— 20° engine.
Automatic Adv.— $21\frac{1}{2}^{\circ}$ at 4000 engine rpm;
Vacuum adv., 15° engine.
Timing— $2\frac{1}{2}^{\circ}$ to 4° before top center.
Alum. head— 4° to 6° before top center.
Coil Amps., Engine Idling— $\frac{1}{2}$ amp.
Coil Amps., Engine Stopped— $2\frac{1}{2}$ amps.

BATTERY

Amps.—Willard 94 amp. hr.

LAMPS

Head—2330L.
Park—55.
Instrument—55.
Fuse—25 volt—20 amp.
Stop and Tail—"B" 63 and 87.

Packard 8, 1937

SERIES 1500-1-2

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{9}{16}$ ".
Stroke—5".
Taxable HP.—32.5.
Displacement—320 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. HP.—135 at 3200 r.p.m.

CAMSHAFT

Drive—Morse No. 3682-kx chain.
Chain Drive—70 links, $1\frac{1}{2}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—8.
End Thrust Taken On—Front end.
End clearance .001"- .004".
Bearing Clearance—.0015"- .0035".

CONNECTING RODS

End Clearance—.005"- .008".
Dia. Clearance—.001"- .002".

COOLING SYSTEM

Capacity—6 gal.
Pump Drive—Fan belt.
Belt Size— $42^{\frac{1}{2}}$ "V, $47\frac{5}{8}^{\frac{1}{2}}$ "x1".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—9.
Material—Babbitt lined steel shell.
End Thrust Taken On—No. 7 bearing.
End Clearance—.003"- .005".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Stromberg "EE-23".
Type—Downdraft Duplex.
Adjustment—Idle adjustment only—Turn in to lean and out to enrich mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—8 qts.
Oil Pressure—35 lbs. at normal driving speed.
Adjustment—Thread.
90°F and over, S. A. E. No. 40.
40°F and over, S. A. E. No. 30.
25°F to 85°F, No. 20 or 20-W.
Oil 10°F to 85°F, S. A. E. No. 20-W.
10°F to 45°F, No. 10-W.
Below 10°F, S. A. E. No. 10-W
+ 10% Kerosene.

PISTONS

Material—Alum. alloy with strut.
Clearance—Bottom—.0015" 3 to 5 lbs. pull.

PISTON RINGS

Gap—Comp. .007"- .012"; Oil .007"- .015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Finger push fit at 160°F.
Fit in Rod—Finger push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{64}$ ".
Dia. Intake— $1\frac{21}{32}$ ".
Stem Dia.—.3405".
Seat Angle—45°.
Seat Width—Not specified.
Tappet Type—Lever and roller.
Clearance—Hot: Intake—.006".
Exhaust—.008".
Guides Removable—Yes.
Spring Pressure—73 lbs. at $3\frac{1}{16}$ ";
159 valve open.

CHASSIS

FRONT AXLE

Caster— $2\frac{1}{2}^{\circ}$ + or — $\frac{1}{2}^{\circ}$.
Camber— 1° + or — $\frac{1}{4}^{\circ}$.
Toe-In— $\frac{1}{32}$ " to $\frac{1}{8}$ ".
Kingpin Angle— $1^{\circ}-30'$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—MRC 5308 and 5304.
Adjustment—Shims.
End Play—Not given.
Lash—.003"- .005".
Diff. Bearing Type—Timken.
Adjustment—Thread.
End Play—.015" spread.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—3 speed helical, synchromesh.
Main Shaft Bearing Type and No.—MRC 211-6AG and 307-6AG.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Hydraulic (Bendix).
Lining Type—Not specified.
Lining Size— $13^{\frac{1}{2}}$ "x $2\frac{1}{2}$ "x $\frac{3}{16}$ " per shoe.
Adjustments—Eccentric for centralizing;
Adjusting screw for clearance;
Adjustable anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—50-50.

CLUTCH

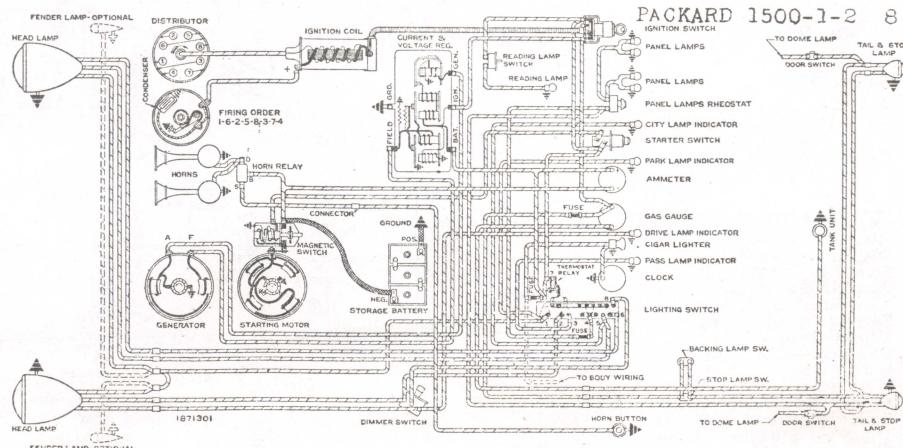
Type—Dry plate.
Facing Type—Not specified.
Pilot Bearing Type and No.—MRC 205SF.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded.

STEERING GEAR

Type—Worm and double roller.
Adjustments—Column end play—shims under worm cover. Cross-shaft end play—adjusting screw. Mesh—Cross shaft adjusting screw.
Lubricant—Steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 729-H.
Drive—Bendix.
Rotation—Clockwise viewing pinion.
No Load—60 amps., 5 volts, 6000 r.p.m.
Lock Torque—16 ft. lbs., 600 amp., 3 volt.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy 961-J.
Drive—Belt.
Regulation—Voltage regulation.
Thermostat—None.
Output, cold—25 amps. at 8 volts at 1650 r.p.m.
Output, hot—25 amps. at 8 volts.
Brush Spring Tension—22-26 oz.
Rotation—Clockwise viewing drive end.
Cutout to close— $6\frac{1}{2}$ to 7 volts.
Amps. Discharge to Open—3 max.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 663-L.
Coil—Delco-Remy 539K.
Distr. Rotation—Clockwise viewing drive end
Breaker Gap—.0125"- .0175".
Brush Spr. Tension—19-23 oz.
Sp. Plug Gap—.028"- .030".
Sp. Plug Size—A. C. or Champion 10 m/m Y-4.
Manual Advance— 24° engine.
Automatic Adv.— $19\frac{1}{2}^{\circ}$ engine at 4000 engine r.p.m. Vacuum adv. 13° max.
Timing— 6° to 8° before top center.
High compression head 4° to $5\frac{1}{2}^{\circ}$ before top center.

Coil Amps., Engine Idling— $\frac{1}{2}$ amp.
Coil Amps., Engine Stopped— $2\frac{1}{2}$ amp.

BATTERY

Amps.—150 amp. hr.

LAMPS

Head—2330-L (R) 1104 (L).
Park—55.
Instrument—"B" 63.
Fuse—25 volt, 20 amp.
Stop and Tail—"B" 63 and 87.

Pierce Arrow Eight

MODEL 1601

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{2}$ ".
Stroke—5".
Taxable H. P.—39.2.
Displacement—385.5 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—150 at 3400 r.p.m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—50 links, $1\frac{1}{2}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Flywheel marking.
Bearings—Steel-backed, babbitt-lined.
End Thrust Taken On—Thrust plate.
Bearing Clearance—.002".

CONNECTING RODS

End Clearance—.004"- .006".
Dia. Clearance—.001"- .002".

COOLING SYSTEM

Capacity—25 qts.
Pump Drive—Shaft, through generator.
Belt Size— $45^{\circ}V$ — $52\frac{5}{8}$ " x $\frac{5}{8}$ ".

CRANKSHAFT

No. Bearings—9.
Material—Steel-backed babbitt.
End Thrust Taken On—Front bearing.
End Clearance—.002"- .004".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Stromberg "EE-3."
Type—Dual downdraft.
Adjustment—Idle adjustment only—Turn in
for lean; out to enrich mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—9 qts.
Oil Pressure—Direct drive, 50 lbs. at 50
m.p.h.; overdrive, 45 lbs. at 50 m.p.h.
Adjustment—Non-adjustable.
Winter Oil—to 0° F. S.A.E. 20W; below
0° F., S.A.E. 10W.
Summer Oil—S.A.E. No. 30.

PISTONS

Material—Alum. alloy—Invar strut.
Clearance—Top—.024".
Clearance—Bottom—.0025".

PISTON RINGS

Gap—.013"- .018".
No. Comp. Rings—3 (1 plain, 2 No.
70 P. C.).
Width— $\frac{1}{16}$ ".
No. Oil Rings—1 (No. 85 P. C.).
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Push fit at 160° F.
Fit in Rod—.0004"- .0006".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{9}{16}$ ".
Dia. Intake— $1\frac{1}{16}$ ".
Seat Dia.—Int. .3725"; Exh. .3715".
Seat Angle—45°.
Seat Width—Not specified.
Tappet Type—Mushroom.
Clearance—Hot:
Intake—Automatic $\frac{1}{16}$ " for
Exhaust—Automatic $\frac{1}{16}$ " valve timing
Guides Removable—Yes.
Spring Pressure
60-65 lbs. at $28\frac{5}{8}$ ".
60-65 lbs. at $28\frac{3}{8}$ ".
120-128 lbs. at $12\frac{3}{8}$ ".

CHASSIS

FRONT AXLE

Caster— $\frac{3}{4}$ °.
Camber— $\frac{1}{2}$ °.
Toe-in— $1\frac{1}{4}$ ".
Kingpin Angle—8°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, Hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lash—.002"- .005".
Diff. Bearing Type—Taper roller.
Adjustment—Not given.
End Play—Not given.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Warner synchro-mesh.
Main Shaft Bearing Type and No.—SSB210
and 308F.
Countershaft Bearing Type and No.—Plain.

BRAKES

Type—Mechanical.
Lining Type—Moulded.
Lining Size— $38^{\prime\prime}$ x $2\frac{1}{4}$ " x $\frac{1}{4}$ ".
Adjustments—One for lining wear.
One for centralizing.
Clearance
Top—.012" rear; front .009".
Bottom—.012" rear; front .009".
Brake Effort—55% front; 45% rear.

CLUTCH

Type—Long single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—SSB 204CP.
Throwout Bearing Type and No.—Faf. M
2861 C.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Ball bearing type.

STEERING GEAR

Type—Cam and lever.
Adjustments
Column end play—nut at top of housing.
Cross-shaft end play—screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Owen-Dyneto.
Drive—Bendix.
Rotation—Clockwise, drive end.
No Load—165 amps., 5.4 volts, 1600 r.p.m.
Lock Torque—25 ft. lbs., 700 amps., 3.8
volts.
Brush Spring Tension—56-60 oz.

GENERATOR

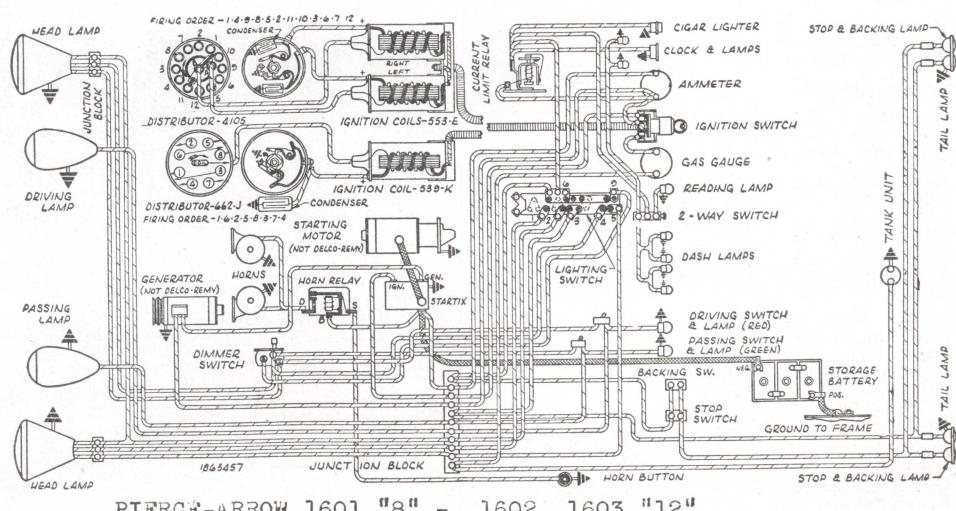
Make—Owen-Dyneto.
Drive—Two belts.
Regulation—Third brush and regulator.
Thermostat—None.
Output, cold—32 amps., 8.0 volts, 1800
r.p.m.
Output, hot—28 amps., 8.0 volts, 2800 r.p.m.
Brush Spring Tension—20-22 oz.
Rotation—Clockwise, drive end.
Cutout to Close—6.75-7.5 volts.
Amps. Discharge to Open—0.5-2.5.
Field Fuse—5 amps. in regulator.

IGNITION

Distributor—Delco-Remy.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.018".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.022"- .025".
Spark Plug Size—Champion 14 m/m "J6."
Manual Advance—33°.
Automatic Advance—12°.
Timing—5 degrees before top center, spark
control advanced.
Coil Amps., Engine Idling—2.2.
Coil Amps., Engine Stopped—4.4.

BATTERY

Amps.—140 amp. hr.



Pierce-Arrow, Twelve

MODELS 1602 & 1603

ENGINE

DATA

No. of Cylinders—12.
Bore— $3\frac{1}{2}$ ".
Stroke—4".
Taxable H. P.—58.8.
Displacement—462 cu. in.
Firing Order—1-4-9-8-5-2-11-10-3-6-7-12.
Max. H. P.—185 at 3400 r.p.m.

CAMSHAFT

Drive—Whitney chain.
Chain Data—53 links, $1\frac{1}{2}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Flywheel marking.
Bearings—Steel-backed, babbitt-lined.
End Thrust Taken On—Thrust plate.
Bearing Clearance—.002".

CONNECTING RODS

End Clearance—.006"—.009".
Dia. Clearance—.001"—.0025".

COOLING SYSTEM

Capacity—38 qts.
Pump Drive—Not given.
Belt Size— $2\frac{1}{2}$ " x $57\frac{1}{2}$ " x $\frac{5}{8}$ ".
Belt Adjustment—Eccentric bracket mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—7.
Material—Bronze-back babbitt.
End Thrust Taken On—Front bearing.
End Clearance—.002"—.004".
Dia. Clearance—.0015"—.003".

FUEL SYSTEM

Carburetor Make—Stromberg "EX-3."
Type—Down-draft (2 singles).
Adjustment—Idle adjustment only—turn in
for lean; out for rich.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—11 qts.
Oil Pressure—50 lbs. at 50 m.p.h.; 45 lbs.
at 50 m.p.h., over drive.
Adjustment—Non-adjustable.
Oil { Summer—Above 30°F—S.A.E. No. 30
Winter — 0°-30°F—S.A.E. No. 20W.
Below 0°F—S.A.E. No. 10W.

PISTONS

Material—Lynite T-slot.
Clearance—Top—.035".
Clearance—Bottom—.002".

PISTON RINGS

Gap—Comp. .013"—.021"; Oil .020"—
.025".
No. Comp. Rings—2.
Width $\frac{1}{16}$ ".
No. Oil Rings—2.
Width $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Push fit at 160°F.
Fit in Rod—.0004"—.0006".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{16}$ ".
Dia. Intake— $1\frac{1}{8}$ ".
Stem Dia.—Int. .373"; Exh. .372".
Seat Angle—45°.
Seat Width—Not specified.
Tappet Type—Mushroom.
Clearance—Hot:
Intake—Automatic.
Exhaust—Automatic.
Guides Removable—Yes.
Spring Pressure—60-65 lbs. at $28\frac{1}{2}$."
120-128 lbs. at $12\frac{1}{2}$ ".

CHASSIS

FRONT AXLE

Caster— $\frac{3}{4}$ °.
Camber—1°.
Toe-in— $\frac{1}{4}$ ".
Kingpin Angle—8°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-elliptic—Hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not specified.
Lash—.002"—.003".
Diff. Bearing Type—Taper roller.
Adjustment—Not given.
End Play—Not given.
Lubricant Capacity—Housing—6 pts.

TRANSMISSION

Make and Type—Warner synchro-mesh.

BRAKES

Type—Mechanical.
Lining Type—Moulded.
Lining Size— $32\frac{1}{2}$ " x $2\frac{1}{4}$ " x $\frac{1}{4}$ ".
Adjustments—One for lining wear.
One for centralizing.
Clearance
Top—Front brake .009"; rear brake .012".
Bottom—Front brake .009"; rear brake .012".
Brake Effort—55% front; 45% rear.

CLUTCH

Type—Long single plate.
Facing Type—Moulded.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Ball-bearing.

STEERING GEAR

Type—Cam and lever.
Adjustments
Column end-play—nut at top of housing.
Cross-shaft end-play—screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Owen-Dyneto.
Drive—Bendix.
Rotation—Clockwise, drive end.
No Load—165 amps., 5.4 volts, 1600 r.p.m.
Lock Torque—25 ft. lbs., 700 amps., 3.8
volts.
Brush Spring Tension—56-60 oz.

GENERATOR

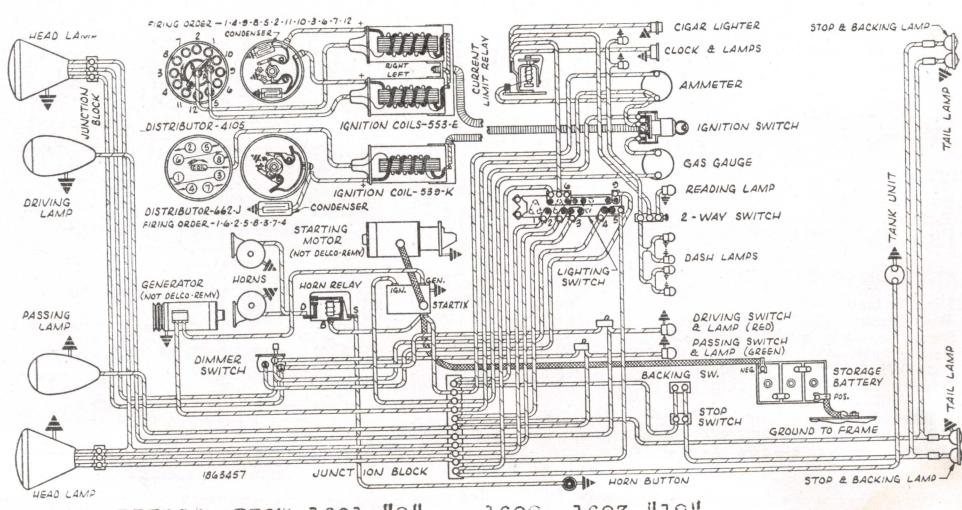
Make—Owen-Dyneto.
Drive—Two V-belts.
Regulation—Third brush and regulator.
Thermostat—None.
Output, cold—32 amps., 8 volts, 1800 r.p.m.
Output, hot—28 amps, 8 volts, 2400 r.p.m.
Brush Spring Tension—20-22 oz.
Rotation—Clockwise, drive end.
Cutout to Close—6.75-7.5 volts.
Amps. Discharge to Open—0.5-2.5.
Field Fuse—5 amps., in regulator.

IGNITION

Distributor—Delco-Remy.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.018".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.022"—.025".
Spark Plug Size—Champion "J6"—14 m/m.
Manual Advance—33°.
Automatic Advance—12°.
Timing—5° before top center, spark control advanced.
Coil Amps., Engine Idling—2.
Coil Amps., Engine Stopped—4.

BATTERY

Amps.—160 amp. hr.



Plymouth, 1938

MODELS P5 and P6

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{8}$ "
Stroke— $4\frac{3}{8}$ "
Taxable H. P.—23.44.
Displacement—201.3 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—82 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—48 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—4, removable except rear.
End Thrust Taken On—End play, .002"- .006".
Bearing Clearance—Front, .001"- .002"; all others .0015"- .0035".

CONNECTING RODS

End Clearance—.0055"- .0115".
Dia. Clearance—.0005"- .0025".

COOLING SYSTEM

Capacity— $3\frac{1}{2}$ gals.
Pump Drive—Fan belt.
Belt Size—Not given.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Bronze-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—P-5, Chandler-Groves; P-6, Carter "B B," EP-6, Carter "B B."
Type—Downdraft single.
Adjustment—"P-5," Turn idle adjustment clockwise for lean, counter-clockwise for richer mixture.
"P-6," $\frac{1}{2}$ - $1\frac{1}{4}$ turns open; "EP-6," $\frac{1}{4}$ to $\frac{3}{4}$ turns open.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h., 15 lbs. idling.
Adjustment—Change spring in relief valve.
Average temp. 90° F... S.A.E. 40.
Average temp. 32° F... S.A.E. 30.
Average temp. 10° F... S.A.E. 20 W.
Oil Average temp.—10° F... S.A.E. 10 W.
plus 10% kerosene.

PISTONS

Material—U-slot, cam-ground, anodized.
Clearance—Top—.021".
Clearance—Bottom—.0005"- .001".

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2, undercut.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2, slotted.
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Thumb push fit at 100° F.
Fit in Rod—Thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{15}{32}$ ".
Stem Dia.—.340"- .341".
Seat Angle—45°.
Seat Width—.0635" ($\frac{1}{16}$ ").
Tappet Type—Not given.
Clearance—Hot: Intake—.006" (for valve timing .011").
Exhaust—.008" (for valve timing .012").
Guides Removable—Yes.
Spring Pressure—34-38 lbs. at $1\frac{3}{4}$ ".
 $77\frac{1}{2}$ lbs. at $1\frac{15}{16}$ ".
Limit of compression $1\frac{3}{8}$.

CHASSIS

FRONT AXLE

Caster—P-5, 3° - 5° , 4 preferred; P-6, 1° - 3° , 2° preferred.
Camber— $\frac{1}{4}$ °- $\frac{3}{4}$ °, $\frac{1}{2}$ ° preferred.
Toe-in— 0° - $\frac{1}{8}$ ", $\frac{1}{16}$ " preferred.
Kingpin Angle— $4\frac{1}{2}$ °- $5\frac{1}{2}$ °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.0015"- .0025" draw (tension).
Lash—.006"- .010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Synchro-mesh.
Main Shaft Bearing Type and No.—Ball.
Countershaft Bearing Type and No.—Needle roller.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Front shoe $10\frac{9}{32}$ " \times 2" \times $13\frac{1}{4}$ ";
rear shoe $7\frac{11}{16}$ " \times 2" \times $13\frac{1}{4}$ ".
Adjustments—Hand brake, $17\frac{1}{16}$ " \times 2" \times $5\frac{3}{32}$ ".
Eccentric for shoe clearance.
Eccentric anchor for each shoe.
Clearance—Top—.012".
Bottom—.006".
Brake Effort—Not given.

CLUTCH

Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Bushing.
Throwout Bearing Type and No.—Ball.

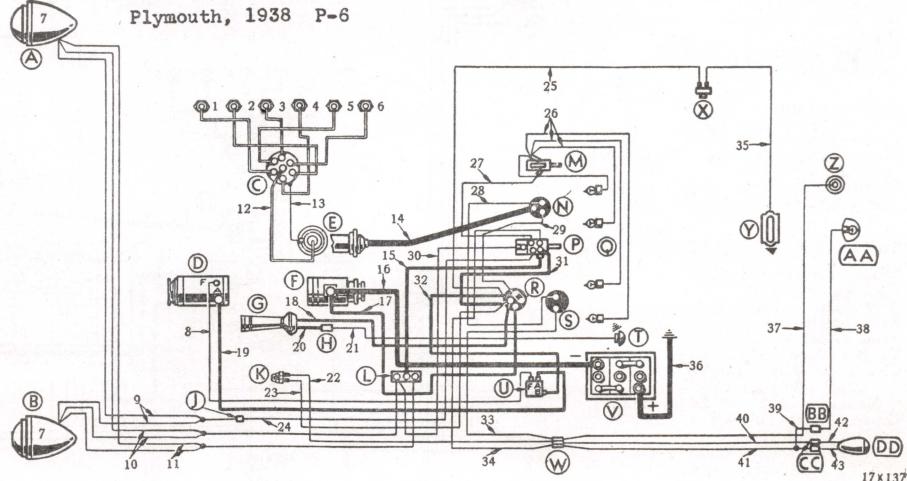
SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded—U.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—shims under lower cover.
Cross-shaft end play—adjusting screw mesh shims on cross-shaft.
Lubricant—Summer, S.A.E. 160 or 140.
Winter, S.A.E. 90.

Plymouth, 1938 P-6



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Manually operated gear.
Rotation—Clockwise, viewing drive end.
No Load—P-5, 70 amps., 5.5 volts, 4300 r.p.m.; P-6, 65 amps., 5.5 volts, 4900 r.p.m.
Lock Torque—P-5, 11.8 ft. lbs., 560 amps., 4.0 volts; P-6, 18 ft. lbs., 4 volts, 670 amps.
Brush Spring Tension—42.53 oz., new brushes.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—P-5, 18 amps., 8.3 volts, 2300 r.p.m.; P-6, 28-32 amps., 8 volts, 3200 r.p.m.
Output, hot—P-5, 16 amps., 8.0 volts, 2600 r.p.m.; P-6, 26-29 amps., 8 volts, 3200 r.p.m.
Brush Spring Tension—P-5, 50-60 oz., new brushes; P-6, 53 oz., new brushes.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7.0 volts at 9.5 m.p.h.
Amps. Discharge to Open—2.5 amps.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise.
Breaker Gap—.020".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—P-5, Champion "J-8," 14 m/m; P-6, Auto-Lite "A-7," 14 m/m.
Manual Advance—None.
Automatic Advance— 22° .
Vacuum Advance— 20° .
Timing—.007", or 4° past top center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

BATTERY

Amps.—90 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps., back of ammeter.
Dome—No. 87.
Stop and Tail—No. 1158.

Plymouth, 1937

MODEL P-3

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{8}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—23.44.
Displacement—201.3 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—82 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—48 links, 1" wide, $1\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through center of both shafts.
Bearings—4, babbitt-lined steel except rear.
End Thrust Taken On—Thrust plate front end. End play .002"- .006".
Bearing Clearance—.0015"- .0035".

CONNECTING RODS

End Clearance—.0055"- .0115".
Dia. Clearance—.0005"- .0025".

COOLING SYSTEM

Capacity— $3\frac{3}{4}$ gals.
Pump Drive—Belt.
Belt Size— $40^{\circ}V$ — $48\frac{3}{4}$ " x $\frac{3}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack, Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed babbitt.
End Thrust Taken On—Rear bearing.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Carter B. & B.
Type—Downdraft single.
Adjustment—Idle $\frac{1}{2}\frac{1}{2}$ turns open.
High speed—fixed jets.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30-45 lbs. at 30 m.p.h.
Adjustment—Replace spring in relief valve.

Oil	70°-110° F.....	S.A.E. No. 40
	40°-110° F.....	S.A.E. No. 30
	32°- 80° F.....	S.A.E. No. 20 or 20W
	10°- 80° F.....	S.A.E. No. 20W only

Oil	-10°- 45° F.....	S.A.E. No. 10W. only
	-30°- 20° F.....	S.A.E. No. 10W. plus 10% kerosene.

PISTONS

Material—Alum. alloy, anodic surface. V-slot.
Clearance—Top—.022".
Clearance—Bottom—.0005"- .001".

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2 (undercut).
Width— $\frac{1}{16}$ ".
No. Oil Rings—2 (slotted).
Width— $5\frac{1}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Tight thumb push fit at 130° F.
Fit in Rod—Tight thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{15}{32}$ ".
Stem Dia.—.3405".
Seat Angle—45°.
Seat Width—.0635".
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006"
(.011" for timing).
Exhaust—.008" (.012" for timing).
Guides Removable—Yes.
Spring Pressure—
34-38 lbs. valve closed— $1\frac{3}{4}$ ".
77-83 lbs. valve open— $1\frac{7}{16}$ ".

CHASSIS

FRONT AXLE

Caster— $1^{\circ}30'$ (2° preferred).
Camber— $\frac{1}{4}^{\circ}$ - $\frac{3}{4}^{\circ}$ ($\frac{1}{2}^{\circ}$ preferred).
Toe-in— $0''$ - $\frac{1}{8}''$ ($\frac{1}{16}''$ preferred).
Kingpin Angle— $4\frac{1}{2}^{\circ}$ - $5\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating hypoid.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Draw tension .004".
Lash—.006"- .010".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Three-speed synchro mesh.
Main Shaft Bearing Type and No.—MRC 207 SFG and 2075.
Countershaft Bearing Type and No.—Needle type.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size—Front, $19\frac{13}{16}$ " x 2" x $1\frac{3}{4}$ ".
Rear, $17\frac{1}{4}$ " x 2" x $1\frac{3}{4}$ ".
Hand brake, $16\frac{5}{16}$ " x 2" x $\frac{5}{32}$ ".

ADJUSTMENTS

Cam adjustment for lining wear.
Eccentric anchor adjustment.
Clearance Top—.012".
Bottom—.006".
Hand brake, .025".
Brake Effort—55% front; 45% rear.

CLUTCH

Type—Single plate.
Facing Type—Moulded and woven.
Pilot Bearing Type and No.—Oilite bronze.
Throwout Bearing Type and No.—Ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—U-Threaded.

STEERING GEAR

Type—Worm and roller.
Adjustments
Column end play—shims at lower cover.
Cross-shaft—adjusting screw.
Mesh—shims under side cover.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Positive shift foot operated.
Rotation—Clockwise, facing drive end.
No Load—65 amps., 5.5 volts, 4900 r.p.m.
Lock Torque—18 ft. lbs., 670 amps., 4 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Third brush on M/P-3; 3rd brush and vibrator type voltage regulator.
Thermostat—None.
Output, cold—18 amps. at 8.3 volts.
Output, hot— $12\frac{1}{2}$ amps., 8 volts, 2400 r.p.m.
Brush Spring Tension—18 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—7 volts at 9 m.p.h.
Amps. Discharge to Open—2.0.
Field Fuse—None.

IGNITION

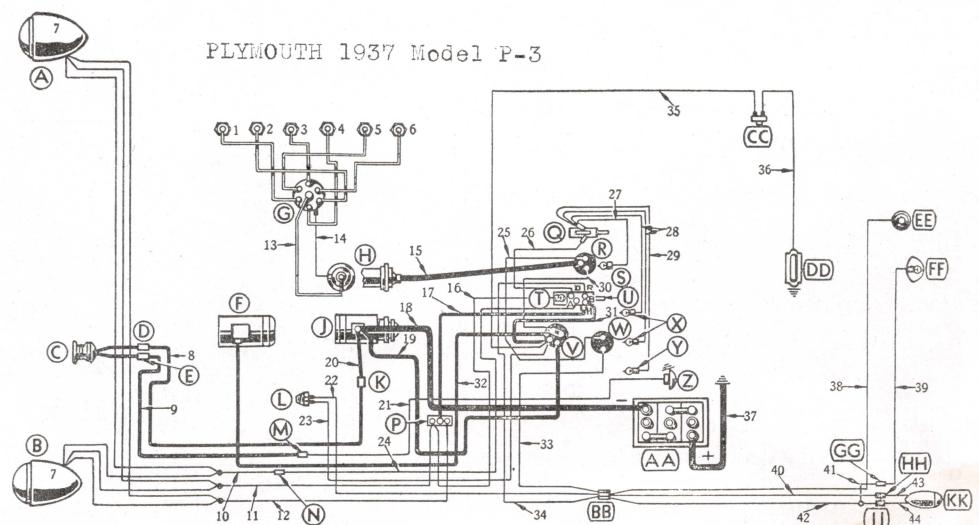
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise, viewed from above.
Breaker Gap—.020".
Brush Spring Tension—18-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—14 m/m. Champion "J.8."
Manual Advance—None.
Automatic Advance—22°.
Vacuum Advance—22°.
Timing—4° or .007" past top dead center.
Coil Amps., Engine Idling—2.0.
Coil Amps., Engine Stopped—5.0.

BATTERY

Amps.—90 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1158.



Plymouth 1936

SERIES PI and P2

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{8}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—23.44.
Displacement—201.31 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—82 at 3600 r.p.m.

CAMSHAFT

Drive—Chain.
Chain Data—Morse, 48 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks in line on shaft centers.
Bearings—4.
End Thrust Taken On—Thrust plate, front end. End play .002"- .006"
Bearing Clearance—No. 1, .001"- .003"; No. 2, 3 and 4, .0015"- .0035".

CONNECTING RODS

End Clearance—.0055"- .0115".
Dia. Clearance—.001"- .003".

COOLING SYSTEM

Capacity— $3\frac{3}{4}$ gals.
Pump Drive—Belt.
Belt Size—V-type, $48\frac{3}{4}$ " x $3\frac{1}{4}$ ".
Belt Adjustment—Generator mounting tension 45-50 lbs.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Nos. 1 and 4, babbitt; Nos. 2 and 3, cadmium nickel.
End Thrust Taken On—Rear.
End Clearance—.003"- .007".
Dia. Clearance—Two center .0015"- .0025".
Front and rear .001"- .002".

FUEL SYSTEM

Carburetor Make—B. & B.
Type—Single down draft.
Adjustment—Low speed—clockwise, lean;
counter-clockwise, rich; high speed fixed.
Fuel Delivery—Mechanical pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30 to 40 lbs. at 30 m.p.h.
Adjustment—Spring replacement.
Winter Oil—S.A.E. No. 20W or No. 10W.
Summer Oil—S.A.E. No. 30 or No. 40.

PISTONS

Material—Alum. alloy.
Clearance—Top—.022".
Clearance—Bottom—Thrust side, feeler gauge .0005"- .001".

PISTON RINGS

Gap—.007"- .015".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—2 (slotted).
Width— $\frac{5}{32}$ ".

PISTON PINS

Type—Floating mounting.
Fit in Piston—Tight thumb push fit at 130° F.
Fit in Rod—Tight thumb push fit at room temperature.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{15}{32}$ "-.341".
Stem Dia.—.340"— .341".
Seat Angle—45°.
Tappet Type—Mushroom.
Clearance—Hot: Intake: .006"
Exhaust: .008", .010" for sustained high speed driving.
Guides Removable—Yes.
Spring Pressure—34 to 38 lbs. valve closed $1\frac{3}{4}$ ", 77 to 83 lbs., valve open $1\frac{1}{16}$ ".

CHASSIS

FRONT AXLE

Caster— 1° to 3° — 2° preferred.
Camber— $\frac{1}{4}^{\circ}$ to $\frac{3}{4}^{\circ}$ — $\frac{1}{2}^{\circ}$ preferred.
Toe-in— $0"$ — $\frac{1}{8}"$.
Kingpin Angle— $9\frac{1}{2}^{\circ}$ + or $-\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.004" draw (tension).
Lash—.006" to .008".
Diff. Bearing Type—Taper roller.
Adjustment—Thread.
End Play—.016" spread.
Lubricant Capacity—Housing— $3\frac{3}{4}$ pt.
Summer—S.A.E. No. 160.
Winter—S.A.E. No. 90.

TRANSMISSION

Make and Type—Own helical gear, synchromesh.
Main Shaft Bearing Type and No.—M. R. C. 2075 F. G. and M. R. C. 2075.
Countershaft Bearing Type and No.—Roller.

BRAKES

Type—Hydraulic.
Lining Type—Moulded.
Lining Size— $19\frac{13}{16}$ " x 2" x $18\frac{1}{4}$ ".
Hand brake, $18\frac{13}{32}$ " x 2" x $5\frac{5}{32}$ ".
Adjustments—Eccentric for lining wear.
Anchor adjustment for relining.
Clearance
Top—.012"
Bottom—.006".
Hand Brake— $\frac{1}{16}$ ".
Brake Effort—55% front, 45% rear.

CLUTCH

Type—Single plate.
Facing Type—Moulded and woven.
Pilot Bearing Type and No.—Bronze.
Throwout Bearing Type and No.—Nice 5068-1.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread, silent "U."

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end plate—shims at bottom. Cross-shaft—adjusting screw in housing. Mesh—shims.
Lubricant—Fluid gear lubricant—
Winter, S.A.E. No. 90.
Summer, S.A.E. No. 160.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Manual shift pinion.
Rotation—Clockwise facing drive end.
No Load—Not available.
Lock Torque—13 ft. lbs., 525 amps. 3.4 volts.
Brush Spring Tension—18 oz.

GENERATOR

Make—Auto-Lite.
Drive—Fan belt.
Regulation—Voltage control and third brush.
Thermostat—None.
Output, cold—21 amps. at 8.3 volts at 2400 r.p.m.
Output, hot—18 amps. at 8.3 volts at 2400 r.p.m.
Brush Spring Tension—18 oz.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.5 to 7.3 volts.
Amps. Discharge to Open—0 to 3 amps.
Field Fuse—6 amps.

IGNITION

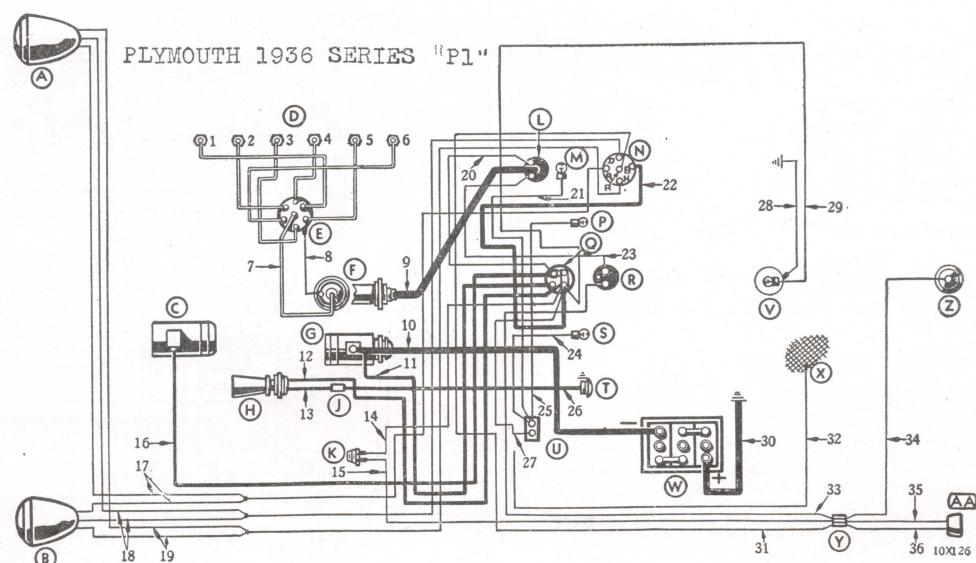
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise from above.
Breaker Gap—.020".
Brush Spring Tension—9 to 13 oz.
Spark Plug Gap—.025".
Spark Plug Size—"S-9"—14 m/m.
Manual Advance—None.
Automatic Advance— 18° .
Timing— 4° after top dead center.
Coil Amps., Engine Idling—2.5.
Coil Amps., Engine Stopped—5.5.

BATTERY

Amps.—86 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 55.
Fuse—20 amps.
Dome—No. 87.
Stop and Tail—No. 1156.



Plymouth 6, 1935

MODEL PJ

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{8}$ "
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—23.44.
Displacement—201.3 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—82 at 3600 r.p.m.

CAMSHAFT

Drive—Silent chain—non-adjustable.
Chain Data—48 links 1" wide, $\frac{1}{2}$ pitch.
Valve Timing—Timing marks on sprockets
opposite each other.
Bearings—4—3 babbitt lined—rear in block.
End Thrust Taken On—Thrust plate front
end.
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.003".
Dia. Clearance—.001".

COOLING SYSTEM

Capacity— $3\frac{3}{4}$ gals.
Pump Drive—Belt.
Belt Size—V— $48\frac{1}{4}$ " x $25\frac{1}{2}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Packless type.

CRANKSHAFT

No. Bearings—4.
Material—Removable, babbitt lined steel.
End Thrust Taken On—Rear bearing.
End Clearance—.003"—.007".
Dia. Clearance—.001"—.002".

FUEL SYSTEM

Carburetor Make—B. & B.
Type—Down draft, plain tube.
Adjustment:
Idle adjustment only.
High speed, fixed jets.
Fuel Delivery—Mechanical fuel pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—5 qts.
Oil Pressure—30 to 60 lbs. at normal driving
speeds.
Adjustment—Non-adjustable—replace springs
in valve.
Winter Oil—S.A.E. No. 20W or 10W.
Summer Oil—S.A.E. No. 30.

PISTONS

Material—Alum. alloy—T-slot cam
ground.
Clearance—Top—Not given.
Clearance—Bottom—.001"—.0015".

PISTON RINGS

—Gap—.007"—.015".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—2.
Width— $5\frac{1}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Tight thumb push fit
at 120°F .
Fit in Rod—Tight thumb push fit at
 70°F .

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{5}{32}$ ".
Dia. Intake— $1\frac{15}{16}$ ".
Stem Dia.—.340".
Seat Angle—45°.
Seat Width—Not specified.
Tappet Type—Mushroom.
Clearance—Hot: Intake—.006".
Exhaust—.008".
Guides Removable—Yes.
Spring Pressure—34.38 lb. valve closed.
.77-.83 lb. valve open.

CHASSIS

FRONT AXLE

Caster—1° to 3°—2° preferred.
Camber— $\frac{1}{2}$ ° + or — $\frac{1}{4}$ °.
Toe-in— $0\frac{1}{2}$ °.
Kingpin Angle—8°-30'.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating—spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.004"—.006", draw.
Lash—.005"—.010".
Diff. Bearing Type—Taper roller.
Adjustment—Adjusting nut.
End Play—.016" tension.
Lubricant Capacity—Housing— $3\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Helical gear.
Main Shaft Bearing Type and No.—M. R. C.
207 F. G.
Countershaft Bearing Type and No.—Straight
roller.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Moulded.
Lining Size— $19\frac{1}{16}$ " x $2\frac{1}{2}$ " x $3\frac{1}{16}$ ". Hand brake
 $18\frac{1}{32}$ " x $2\frac{1}{2}$ " x $5\frac{1}{32}$ ".
Adjustments:
Cam adjustment at each shoe for lining
wear.
Clearance:
Heel—.005".
Toe—.010".
Brake Effort—50-50.

CLUTCH

Type—Single plate, ventilated, knife-edge type.
Facing Type—Asbestos.
Pilot Bearing Type and No.—Bronze.
Throwout Bearing Type and No.—Nice
5068-1.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—U—threaded.

STEERING GEAR

Type—Worm and roller.
Adjustments:
Column end play—shims at lower cover.
Cross-shaft—adjusting screw.
Mesh—shims at housing cover.
Lubricant—Fluid gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Mechanical positive shift.
Rotation—Clockwise facing drive end.
No Load—Not available.
Lock Torque—13 ft. lbs., 525 amps., 3.4 volts.
Brush Spring Tension—18 oz.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Voltage control and third brush.
Thermostat—None.
Output, cold—21 amps., 8.6 volts, 2400
r.p.m. M/"PJ" DeLuxe, 18 amps., 8.3
volts, 2400 r.p.m. M/"PJ" Std.
Output, hot— $18\frac{1}{2}$ amps., 8.4 volts, 2400
r.p.m. M/"PJ" DeLuxe, 15.2 amps., 8
volts, 2400 r.p.m. M/"PJ" Std.
Brush Spr. Tension—18 oz.
Cutout to Close—6.5 to 7.3 volts.
Amps. Discharge to Open—0.3 amps.
Field Fuse—M/"PJ"—5 amps. None M/"PJ"
Std.

IGNITION

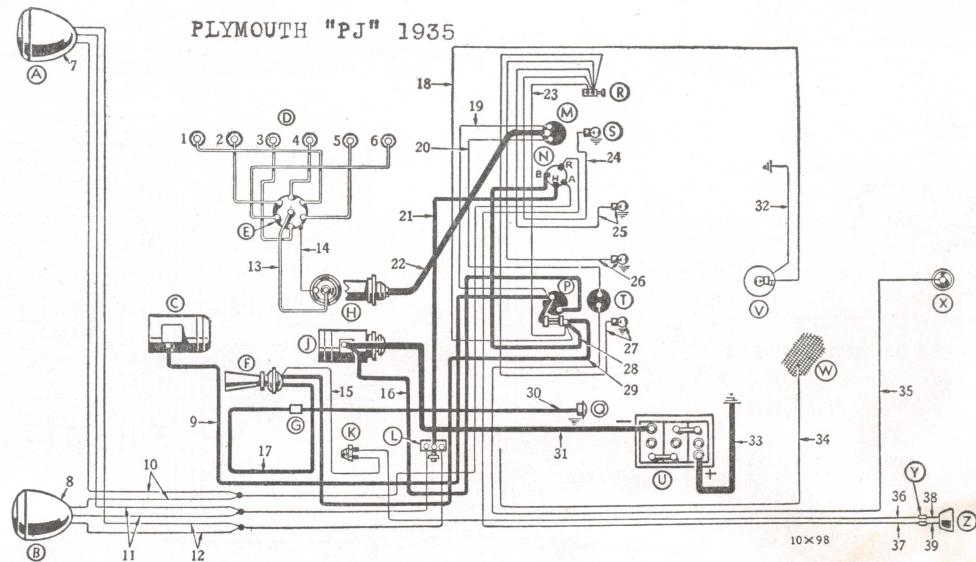
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Clockwise from above.
Breaker Gap—.020".
Brush Spr. Tension—18 oz.
Sp. Plug Gap—.025".
Sp. Plug Size—14m in A. C. K-9.
Manual Advance—None.
Automatic Adv.— 18° engine. Vacuum ad-
vance 10° .
Timing— 4° or .007" piston travel past top
dead center.
Coil Amps., Engine Idling—2.5 amps.
Coil Amps. Engine Stopped—5.5 amps.

BATTERY

Amps.—86 amp. hr.—13 plate.

LAMPS

Head—Mazda 2320-C.
Park—Mazda 55.
Instrument—Mazda 63.
Fuse—20 amp. back of ammeter.
Dome—Mazda 87.
Stop and Tail—Mazda 1158.



Plymouth 6, PF, PE and PG, 1934

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{8}$ ". Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—23.44.
Displacement—201.3 cu. in.
Firing Order—1-5-3-6-2-4.
Maximum H. P.—77 at 3600 r.p.m. (5.8 ratio).

CAMSHAFT

Drive—Silent chain.
Chain Data—48 links; $\frac{3}{4}$ " pitch; no adjustment.
Valve Timing—Checked at front by marks on sprocket; opposite and in line.
Bearings—4, babbitt-lined steel.
End Thrust—Taken on thrust plate behind sprocket hub. End Play—.003"- .005".
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.003"- .009".
Diameter Clearance—.001"- .00275".

COOLING SYSTEM

Capacity— $3\frac{1}{2}$ gallons.
Pump Drive—V-belt.
Belt Adjustment—Shifting generator.
Pump Packing Adjustment—None.

CRANKSHAFT

No. Bearings—4.
Material—Babbitt-lined steel.
End Thrust—Taken on rear.
End Clearance—.003"- .007".
Diameter Clearance—.001"- .002".

FUEL SYSTEM

Carburetor Make—Special.
Type—Plain tube, downdraft.
Adjustment—Idle only; in, lean; out, rich.
Fuel level $\frac{1}{8}$ " below surface of float chamber.
Fuel Delivery—Pump.

LUBRICATION

Type—Forced feed.
Pump Type—Gear.
Capacity—5 quarts.
Oil Pressure—30 lbs. at 25 m.p.h.
Adjustment—Relief valve spring replacement.
Winter Oil—S. A. E. No. 20-W or 10-W.
Summer Oil—S. A. E. No. 30.

PISTONS

Material—Aluminum.
Clearance—Top, .022".
Bottom, .0015".

PISTON RINGS

Gap—.007"- .015".
No. Compression Rings—3, (one recessed), early models; 2, late models.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1, early models; 2, late models.
Width— $\frac{3}{32}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—Tight thumb-push fit at 120° F.
Fit in Rod—Light thumb-push fit at 70° F.

VALVES AND TAPPETS

Diameter Exhaust— $1\frac{1}{8}$ ".
Diameter Intake— $1\frac{5}{8}$ ".
Seat Diameter—.340"- .341".
Seat Angle— 45° .
Seat Inserts—Exhaust.
Tappet Type—Mushroom.
Clearance:
Hot: Intake, .006" (timing, .011").
Exhaust, .008" (timing, .012").
Guides Removable?—Yes.
Spring Pressure—77-85 lbs., compressed.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}^{\circ}$.
Camber— $\frac{1}{2}^{\circ}$.
Toe-in—0" - $\frac{1}{8}$ ".
Kingpin Angle—Including camber angle, 10° .
Tie Rod Adjustment—Threaded sockets.

REAR AXLE

Type—Semi-floating.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—.004"-.006".
Lash—.005"-.010".
Differential Bearing Type—Taper roller.
Adjustment—Threaded nuts.
End Play—.016".
Lubricant Capacity Housing— $3\frac{1}{4}$ pints.

BRAKES

Type—Two-shoe hydraulic.
Lining Type—Molded.
Lining Size—P. E., $\frac{1}{8}" \times 2"$.
P. F., $\frac{1}{8}" \times 2"$.
Adjustments—Anchor Bolt, eccentric.
Shoes, cams.
Clearance—Toe, .010".
Heel, .005" front, .007" rear shoe.

CLUTCH

Type—Single plate dry.
Facing Type—Molded, 9" disc.

SPRINGS

Type Front—Coil, independent springing.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent U-thread.

STEERING GEAR

Type—Worm and roller.
Adjustments:
Worm Shaft—Shims and spring washers.
Cross Shaft—Adjusting screw.
Gear Mesh—Shims.
Lubricant—Fluid gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy No. 734-H.
Drive—Overrunning clutch.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5 volts, 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63 volts.
Brush Spring Tension—24-28-oz.

GENERATOR

Make—Delco-Remy, No. 937P (P. E.);
No. 937G, (P. F.).
Drive—Fan belt.
Regulation—Third brush, external voltage on P. E.
Thermostat—None.
Output, Cold:
Model P. E.,
19-22 amps., 8.5 volts, 2400 r.p.m.
Model P. F.,
15-17 amps., 8.0 volts, 1900 r.p.m.

Output, Hot:
Model P. E.,
12-15 amps., 7.8 volts, 2600 r.p.m.
Model P. F.,
10-13 amps., 7.6 volts, 2100 r.p.m.

Brush Spring Tension:
Model P. E., 22-26-oz.; 3rd, 16-20-oz.
Model P. F., 14-18-oz.

Rotation—Clockwise, viewing from drive end.
Cutout to Close—6.75 volts.
Amps. Discharge to Open:
Model P. E., 3 amps. maximum;
Model P. F., 2.5 amps.

Field Fuse—P. E., 6 amps. (no higher) in control unit.

IGNITION

Distributor—Delco-Remy; P. E., No. 644K; P. F., No. 622.

Coil and Switch—Delco-Remy, No. 540A.
Distributor Rotation—Counter-clockwise, viewing from drive end.

Breaker Gap—.020".
Arm Spring Tension—9-13-oz.
Spark Plug Gap—.025".

Spark Plug Size—14 mm.; S9 standard head, SL9, aluminum head.

Automatic Advance—P. F., 18° max.; P. E., 32° max.

Timing—P. F., 9° or $.032"$.
B. T. C. marks on flywheel.
P. E., 3° or $.004"$;
A. T. C. marks on impulse neutralizer.

Coil Amps., Engine Idling, 2 amps.
Engine Stopped, 4.5 amps.

BATTERY

Amps.—84 at 5 amps. discharge.

LAMPS

Head—Mazda, No. 1116, PE; No. 1110, PF.

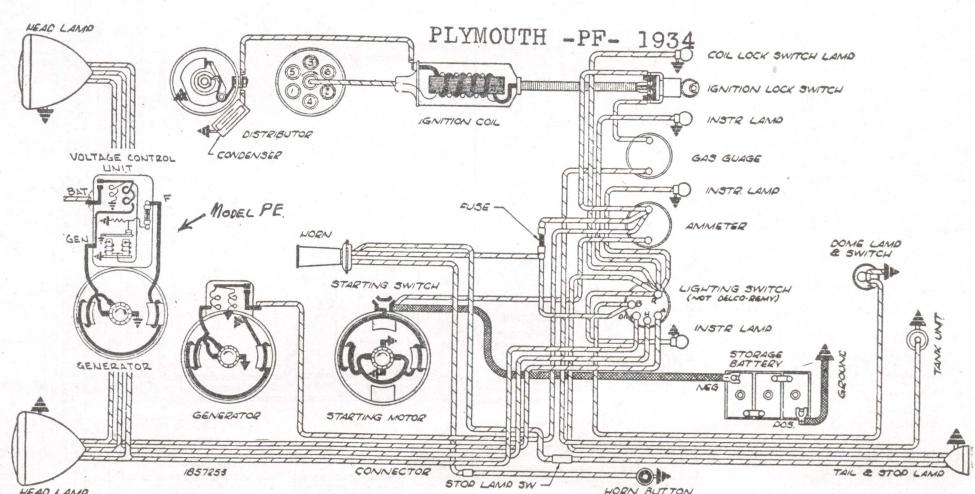
Park—Mazda, No. 63.

Instrument—Mazda, No. 63.

Fuse—20 amp., on back of ammeter.

Dome—P. E., Mazda No. 87;
P. F., Mazda No. 81.

Stop and Tail—Mazda No. 1158.



Pontiac 6, 1938

MODEL 38-26DA

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{2}$ ".
Stroke— $4\frac{1}{2}$ ".
Taxable H. P.—28.3.
Displacement—222.7 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—85 at 3520 r.p.m.

CAMSHAFT

Drive—Morse.
Chain Data—56 links, 1" wide, $\frac{3}{8}$ " pitch.
Valve Timing—"0" marks on sprockets opposite each other on line through shaft centers.
Bearings—4, steel-backed babbitt.
End Thrust Taken On—Thrust plate front end, end play .002"- .005".
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.005"- .010".
Dia. Clearance—.0005"- .0015".

COOLING SYSTEM

Capacity—16 qts.
Pump Drive—Fan belt.
Belt Size— $28^{\circ}V$, $46\frac{1}{2} \times \frac{3}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Automatic.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed white bearing metal alloy.
End Thrust Taken On—Rear center.
End Clearance—.003"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter W-1-401S.
Type—Downdraft, single.
Adjustment—Idle— $\frac{1}{4}$ to $1\frac{1}{2}$ turns open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—35-40 lbs. above 40 m.p.h.
Adjustment—Non-adjustable.

Oil	Average daytime temperature, 90° F. or higher, S.A.E. No. 30.
	32° F.—110° F.—S.A.E. No. 20W. or 20.
	10° F.—110° F.—S.A.E. No. 20W.
	-10° F.—70° F.—S.A.E. No. 10W.
-30° F.—20° F.—S.A.E. No. 10W., plus 10% kerosene.	

PISTONS

Material—Chrome-nickel iron, tin-plated.
Clearance—Top—.023".
Clearance—Bottom—.002" with $\frac{1}{2}$ " feeler.

PISTON RINGS

Gap—.007"- .017".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in piston.
Fit in Piston—Under 200 to 300 pounds.
Fit in Rod—.0003"- .0005".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{5}{16}$ ".
Dia. Intake— $1\frac{11}{16}$ ".
Stem Dia.—.310"- .311".
Seat Angle—Int. 30°, Exh. 45°.
Seat Width—Not given.
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.011"- .013" hot and running.
Exhaust—.011"- .013" hot and running.
Guides Removable—Yes.
Spring Pressure
54 $\frac{1}{2}$ lbs. at $129\frac{1}{2}$ ".
96 lbs. at $179\frac{1}{2}$ ".

CHASSIS

FRONT AXLE
Caster— $3\frac{1}{2}$ °— $1\frac{1}{4}$ ° (curb weight).
Camber— $\frac{1}{2}$ °— $+1$ ° (curb weight).
Toe-in—0"- $\frac{1}{16}$ ".
Kingpin Angle— $4\frac{1}{2}$ °— 5 °.
Tie Rod Adj.—Thread.

REAR AXLE
Type—Semi-floating spiral bevel.
Pinion Bearing Type—N. D. No. 905306 and Hyatt No. 107391.
Adjustment—Shims.
End Play—Not given.
Lash—Min. .003".
Diff. Bearing Type—Hyatt roller No. 127861.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—3 pts.

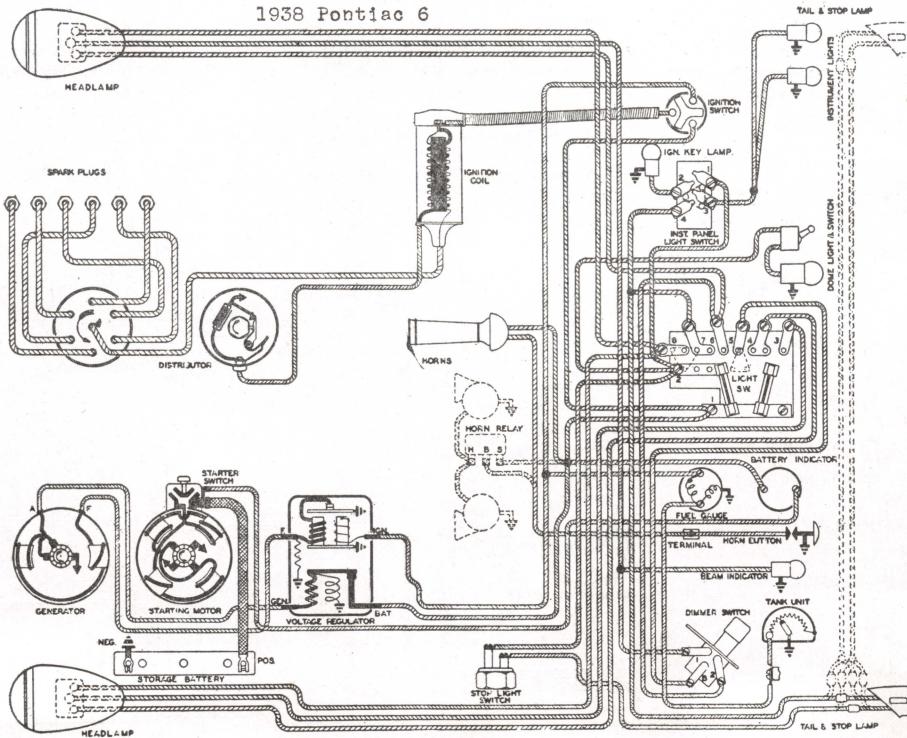
TRANSMISSION
Make and Type—Own, 3-speed, helical gear.
Main Shaft Bearing Type and No.—N. D. Ball No. 954144 and 907506.
Countershaft Bearing Type and No.—Bronze .867" x .993" x 2".

BRAKES
Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $23\frac{1}{16}$ " x $1\frac{3}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Eccentric anchor adjustment.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—52% front, 48% rear.

CLUTCH
Type—Own.
Facing Type—Moulded.
Pilot Bearing Type and No.—Hyatt roller No. 142655.
Throwout Bearing Type and No.—Graphite ring $1\frac{1}{2}$ " x $2\frac{3}{8}$ " x $\frac{3}{4}$ ".

SPRINGS
Type Front—Coil.
Type Rear—Semielliptic..
Shackle Adjustment—Thread (rear only).

STEERING GEAR
Type—Saginaw worm and roller.
Adjustments—Column end-play—adjusting screw at bottom.
Cross-shaft end-play—adjusting screw.
Mesh—Adjusting plate at bottom.
Lubricant—All-season steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 729E.
Drive—Manual shift.
Rotation—Clockwise viewing pinion.
No Load—60 amps., 5.0 volts, 6000 r.p.m.
Lock Torque—16 ft. lbs., 600 amps., 3.0 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy No. 1100003.
Drive—Fan belt.
Regulation—3rd brush with voltage regulator.
Thermostat—None.
Output, cold—26-30 amps., 8 volts, 3300 r.p.m.
Output, hot—24-28 amps., 8 volts, 3300 r.p.m.
Brush Spring Tension—Not given.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.5 to 7.25 volts.
Amps. Discharge to Open—3.0 max. at 6.3 volts.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 647-D.
Coil—Delco-Remy 539L.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.020".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.025" (.022" on radio cars).
Spark Plug Size—14 m/m A. C. Model 45-14.
Manual Advance—20°.
Automatic Advance—22°.
Vacuum Advance—15°.
Timing—2° to 6° before top dead center.
Coil Amps., Engine Idling—Not given.
Coil Amps., Engine Stopped—Not given.

BATTERY

Amps.—Delco, 98 amp. hour

LAMPS

Head—2320L.
Park—55.
Instrument—55.
Fuse—3A-20 amps.
Dome—81L.
Stop and Tail—87L.

LIGHTING SWITCH
1- RED TR. (HOT)
2- RED CR. TR.
3- BLACK TR.
4- GREEN CR. TR.
5- RED & GREEN CR. TR.
6- GREEN CR. TR.
7- GREEN CR. TR.
8- BLACK CR. TR. - NATURAL

IGNITION SWITCH
RED CR. (HOT)
BLACK TR.

INSTRUMENT LAMP SWITCH
1- RED CR. TR.
2- IGN. KEY LAMP
3- HORN RELAY
4- GREEN TR.

FUEL GAUGE
1- RED CR. TR.
2- RED CR. TR.

PARKING BRAKE LIGHT
1- RED CR. TR.
2- RED & GREEN CR. TR.

STOPLIGHT SWITCH
RED TR. (HOT)
RED TR.

VOLTAGE REGULATOR
BAT - RED CR. TR.
IGN. - BLACK CR. TR.
GEN. - BLACK CR. TR.
GEN. - RED CR. TR.

GENERATOR
A- BLACK & RED CR. TR.
F- BLACK TR.

R.H. HEADLAMP
LOWER BEAM - BLACK CR. TR.
UPPER BEAM - BLACK CR. TR.

PARKING
BLACK CR. TR.

Pontiac 8, 1938

MODEL 38-28DA

ENGINE

DATA

No. of Cylinders—8.
Bore— $\frac{3}{4}$ ".
Stroke— $\frac{3}{4}$ ".
Taxable H. P.—33.8.
Displacement—248.9 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—100 at 3700 r.p.m.

CAMSHAFT

Drive—Morse chain.
Chain Data—56 links, $\frac{27}{32}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—"0" marks on sprockets opposite each other on line through shaft centers.
Bearings—5, steel-backed babbitt.
End Thrust Taken On—Thrust plate front end, end play .002"- .005".
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.005"- .010".
Dia. Clearance—.0005"- .0015".

COOLING SYSTEM

Capacity—19 qts.
Pump Drive—Fan belt.
Belt Size— $28^{\circ}V$ — $461\frac{1}{16}$ " x $\frac{3}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adjustment—Automatic.

CRANKSHAFT

No. Bearings—5.
Material—Steel-backed white bearing metal alloy.
End Thrust Taken On—Rear center.
End Clearance—.003"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter W-1-400S.
Type—Downdraft, single.
Adjustment—Idle— $\frac{1}{2}$ - $\frac{1}{4}$ turns, open.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—35-40 lbs. above 40 m.p.h.
Adjustment—Non-adjustable.
Average daytime temperature, 90° F. or higher, S.A.E. No. 30.
 32° F.— 110° F.—S.A.E. No. 20W. or 20.
Oil { 10° F.— 110° F.—S.A.E. No. 20W.
 10° F.— 70° F.—S.A.E. No. 10W.
 30° F.— $+20^{\circ}$ F.—S.A.E. No. 10W., plus 10% kerosene.

PISTONS

Material—Chrome-nickel iron, tin-plated.
Clearance—Top—.023".
Clearance—Bottom—.002"
with $\frac{1}{2}$ " feeler.

PISTON RINGS

Gap—.007"- .017".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in piston.
Fit in Piston—Under 200 to 300 pounds.
Fit in Rod—.0003"- .0005".

VALVES AND TAPPETS

Dia. Exhaust— $11\frac{1}{32}$ ".
Dia. Intake— $11\frac{5}{32}$ ".
Seat Dia.—.310"- .311".
Seat Angle—Int. 30°, Exh. 45°.
Seat Width—Not given.
Tappet Type—Cylindrical.
Clearance—Hot: Intake .011"- .013" hot and running.
Exhaust—.001"- .013" hot and running.
Guides Removable—Yes.
Spring Pressure— $54\frac{1}{2}$ lbs. at $29\frac{1}{32}$ ".
96 lbs. at $11\frac{1}{32}$ ".

CHASSIS

FRONT AXLE

Caster— $\frac{3}{4}$ ° to $1\frac{1}{4}$ ° (curb weight).
Camber— $\frac{1}{2}$ ° + $1\frac{1}{2}$ ° (curb weight).
Toe-in— 0° . $1\frac{1}{16}$ °.
Kingpin Angle— $4\frac{1}{2}$ °-5°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—N. D. No. 905306 and Hyatt No. 107391.
Adjustment—Shims.
End Play—Not given.
Lash—Min. .003".
Diff. Bearing Type—Hyatt roller No. 127861.
Adjustment—Thread.
End Play—Not given.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own, 3-speed, helical gear.
Main Shaft Bearing Type and No.—N. D. Ball No. 954144 and 907506.
Countershaft Bearing Type and No.—Bronze .867" x .993" x 1".

BRAKES

Type—Bendix hydraulic.
Lining Type—Moulded.
Lining Size— $23\frac{1}{16}$ " x $1\frac{3}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Eccentric anchor adjustment.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—52% front, 48% rear.

CLUTCH

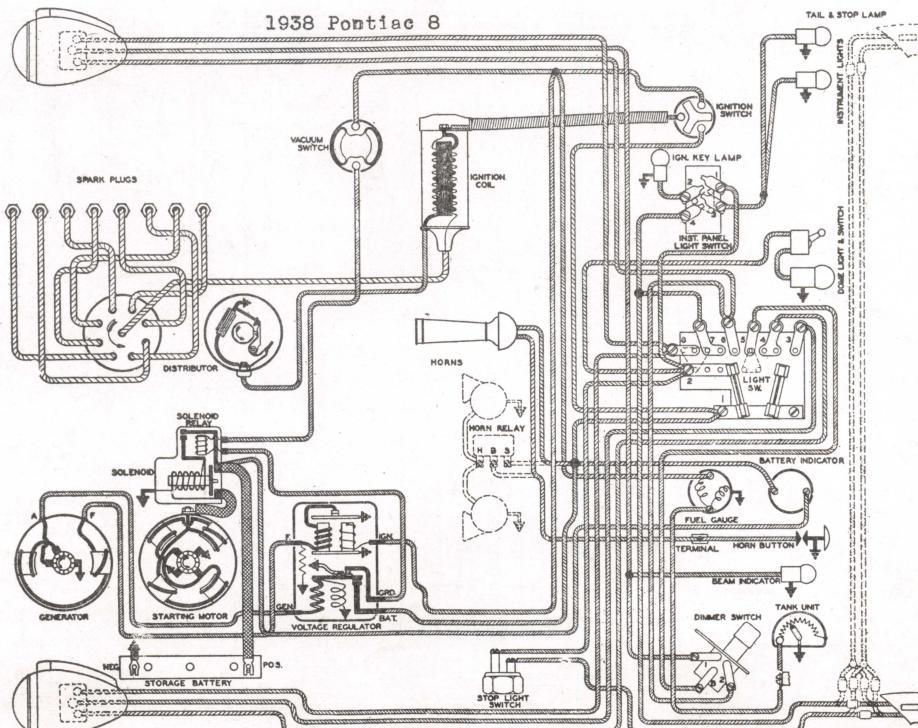
Type—Own.
Facing Type—Moulded.
Pilot Bearing Type and No.—Hyatt roller No. 142655.
Throwout Bearing Type and No.—Graphite ring $1\frac{1}{2}$ " x $2\frac{3}{8}$ " x $\frac{3}{4}$ ".

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded (rear only).

STEERING GEAR

Type—Saginaw worm and roller.
Adjustments—Column end play—adjusting screw at bottom.
Cross-shaft end play—adjusting screw mesh—Adjusting plate at bottom.
Lubricant—All season steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 727S.
Drive—Electrically controlled manual shift.
Rotation—Clockwise viewing pinion.
No Load—60 amps., 5.0 volts, 6000, r.p.m.
Lock Torque—15 ft. lbs., 600 amps., 3.0
volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy No. 1100003.
Drive—Fan belt.
Regulation—3rd brush and voltage regulator.
Thermostat—None.
Output, cold—26-30 amps., 8 volts, 3300
r.p.m.
Output, hot—24-28 amps., 8 volts, 3300
r.p.m.
Brush Spring Tension—Not given.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.5 to 7.25 volts.
Amps. Discharge to Open—3.0 max. at 6.3
volts.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy 663X.
Coil—Delco-Remy 539L.
Distr. Rotation—Center-clockwise.
Breaker Gap—.015".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025" (.022" on radio cars).
Spark Plug Size—14 m/m A. C., Model No. 45-14.
Manual Advance—20°.
Automatic Advance—22°.
Vacuum Advance—20°.
Timing—2° to 6° before top dead center.
Coil Amps., Engine Idling—Not given.
Coil Amps., Engine Stopped—Not given.

BATTERY

Amps.—Delco, 112 amp. hour.

LAMPS

Head—2320L.
Park—55.
Instrument—55.
Fuse—3A—20 amps.
Dome—81L.
Stop and Tail—87L.

LIGHTING SWITCH	
1—RED CR. TR.	2—GREEN CR. TR.
2—BLACK CR. TR.	3—BLACK CR. TR.
3—RED CR. TR.	4—GREEN CR. TR.
4—BLACK CR. TR.	5—RED CR. TR.
5—GREEN CR. TR.	6—RED CR. TR.
6—BLACK CR. TR.	7—GREEN CR. TR.
7—BLACK CR. TR.	8—BLACK CR. TR.
8—BLACK CR. TR.	NATURAL
IGNITION SWITCH	
RED CR. (HOT)	BLACK CR. TR.
INST. PANEL LAMP SWITCH	
1—RED CR. TR.	2—GREEN CR. TR.
2—BLACK CR. TR.	3—INST. LIGHTS
3—GREEN CR. TR.	4—GREEN CR. TR.
4—BLACK CR. TR.	5—INST. LIGHTS
5—RED CR. TR.	6—BLACK CR. TR.
6—BLACK CR. TR.	7—RED CR. TR.
7—GREEN CR. TR.	8—BLACK CR. TR.
8—BLACK CR. TR.	NATURAL
BEAM INDICATOR	
BLACK CR. TR.	BLACK CR. TR.
BATTERY INDICATOR	
BLACK CR. TR.	RED CR. TR.
DIMMER SWITCH	
BLACK CR. TR.	BLACK CR. TR.
BLACK CR. TR.	BLACK & GREEN CR. TR.
STOP/LIGHT SWITCH	
RED CR. (HOT)	RED CR. TR.
VOLTAGE REGULATOR	
BAT.—RED CR. TR.	GEN.—RED CR. TR.
GEN.—BLACK CR. TR.	IGN.—BLACK CR. TR.
IGN.—BLACK CR. TR.	F.
F.	GEN.—BLACK & RED CR. TR.
GENERATOR	
A—BLACK & RED CR. TR.	F—BLACK CR. TR.
R.H. HEADLAMP	
LOWER BEAM—RED CR. TR.	UPPER BEAM—BLACK CR. TR.
UPPER BEAM—BLACK CR. TR.	PARKING—BLACK CR. TR.
L.H. HEADLAMP	
UPPER BEAM—BLACK CR. TR.	LOWER BEAM—RED CR. TR.
LOWER BEAM—RED CR. TR.	PARKING—BLACK CR. TR.
TAIL & STOP LAMP	

Pontiac 8, 1937

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{4}$ ".
Stroke— $3\frac{3}{4}$ ".
Taxable HP.—33.8.
Displacement—248.9 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. HP.—100 at 3800 r.p.m.

CAMSHAFT

Drive—Silent chain.
Chain Data—56 links, $2\frac{1}{2}$ " wide, $\frac{3}{8}$ " pitch.
Valve Timing—Sprocket marks opposite each other on line through shaft centers.
Bearings—5, steel backed, babbitt lined.
End Thrust Taken On—Thrust plate.
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.005"- .010".
Dia. Clearance—.0005"- .0015".

COOLING SYSTEM

Capacity—19 qts.
Pump Drive—Fan belt.
Belt Adjustment—Generator link.
Pump Pack, Adj.—Thread.

CRANKSHAFT

No. Bearings—5.
Material—Steel backed, Babbitt lined.
End Thrust Taken On—Rear center.
End Clearance—.003"- .008".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter.
Type—Down draft single.
Adjustment—Idle $\frac{1}{2}$ -1 turn open;
High speed, fixed jet.
Fuel Delivery—A-C camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—7 qts.
Oil Pressure—35-45 lbs. warm oil, average speed.
Adjustment—Non-Adjustable.

Oil	50°-110° F—S. A. E. No. 30.
	30°-110° F—S. A. E. No. 20.
	10°-110° F—S. A. E. No. 20-W.
	—10°- 60° F—S. A. E. No. 10-W. plus 10% Kerosene.

PISTONS

Clearance—Bottom—.002"
with $\frac{1}{2}$ " feeler.

PISTON RINGS

Gap—.007"- .017".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in piston.
Fit in Rod—.0003"- .0005".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{1}{2}\frac{1}{2}$ ".
Dia. Intake— $1\frac{1}{2}\frac{1}{2}$ ".
Stem Dia.—.310"- .311".
Seat Angle—Intake 30°, exhaust 45°.
Seat Width—Not given.
Tappet Type—Cylindrical.
Clearance—Hot: Intake—.011"- .013".
Exhaust—.011"- .013".
Guides Removable—Yes.

Spring Pressure—56 lbs., at 129°F valve closed;
96 lbs. valve open.

CHASSIS

FRONT AXLE

Caster— $-\frac{1}{2}^{\circ}$ — $+\frac{1}{4}^{\circ}$ (5 pass. load).
Camber— $\frac{1}{8}^{\circ}$ — $-\frac{1}{2}^{\circ}$ (5 pass. load).
Toe-in— 0° — $\frac{1}{16}^{\circ}$ (5 pass. load).
Kingpin Angle— 4° — 52° .
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—N. D. 5306 and Hyatt C 1509.
Adjustment—Shims.
End Play—Varies with pinion marking.
Lash—Not less than .003" or over .010".
Diff. Bearing Type—Hyatt KA 11360Z.
Adjustment—Thread.
End Play— $1\frac{1}{2}$ to $2\frac{1}{2}$ notches tight.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Own synchro-mesh.
Main Shaft Bearing Type and No.—ND Ball 47507 and 3206.
Countershaft Bearing Type and No.—Bronze.

BRAKES

Type—Bendix hydraulic.
Lining Type—Molded.
Lining Size— $2\frac{3}{4}^{\frac{1}{16}}$ " x $1\frac{3}{4}^{\frac{1}{16}}$ " x $8\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing; adjusting screw for clearance; Anchor eccentric type.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—52% front; 48% rear.

CLUTCH

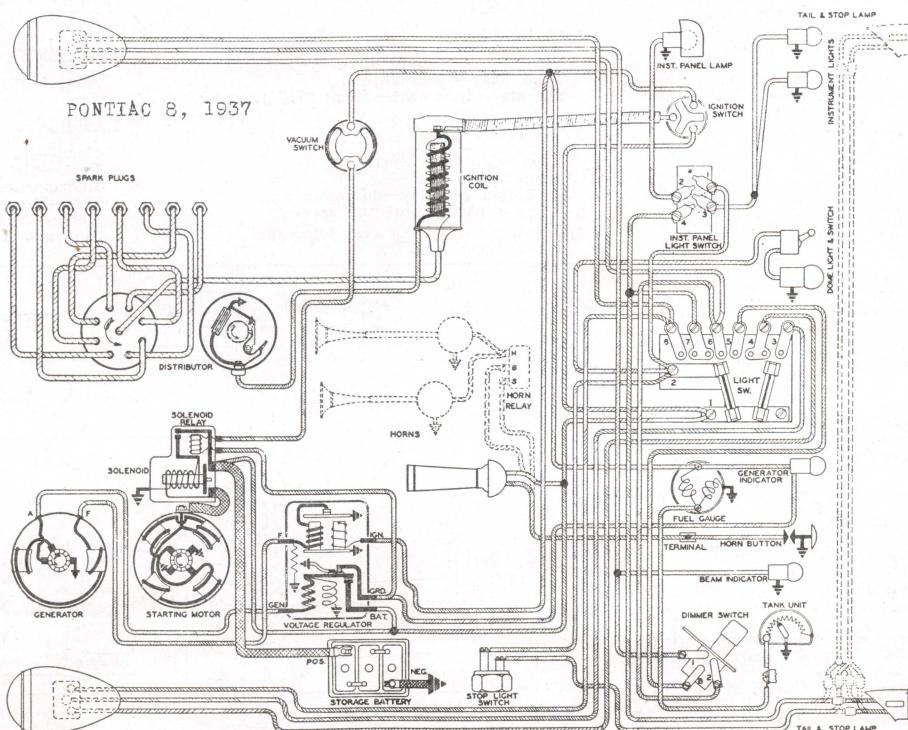
Type—Single plate.
Facing Type—Woven.
Pilot Bearing Type and No.—Hyatt 99004.
Throwout Bearing Type and No.—Carbon
 $1\frac{1}{2}^{\frac{1}{16}}$ " x $2\frac{1}{8}^{\frac{1}{16}}$ " x $\frac{3}{4}$ ".

SPRINGS

Type Front—Coil.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Worm and roller.
Adjustments—Column end play—adjusting nut at bottom. Cross shaft end play—adjusting screw. Mesh—eccentric at bottom.
Lubricant—11 oz. steering gear lubricant.



Reo 6-D, 1936

FLYING CLOUD

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{3}{8}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—27.3.
Displacement—228.0 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—90 at 3400 r.p.m.

CAMSHAFT

Drive—Morse chain.
Chain Data—48 links, 1" wide, $\frac{1}{2}$ " pitch.
Valve Timing—Intake opens top dead center.
Check to flywheel "UDC" mark.
Bearings—4.
End Thrust Taken On—Front end.
Bearing Clearance—.002".

CONNECTING RODS

End Clearance—.005"- .010".
Dia. Clearance—.0015"- .0025".

COOLING SYSTEM

Capacity—18 qts.
Pump Drive—Belt.
Belt Size—V-type— $44\frac{3}{4}$ " outside x .796".
Belt Adjustment—Slotted fan mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—7.
Material—Babbitt steel back.
End Thrust Taken On—Rear bearing.
End Clearance—.003"- .007".
Dia. Clearance—.001"- .003".

FUEL SYSTEM

Carburetor Make—Carter W-1.
Type—Downdraft single.
Adjustment—Idle, $\frac{1}{2}$ - $\frac{1}{4}$ turns open.
High speed fixed.
Float level $\frac{1}{16}$ ".
Fuel Delivery—A. C. Model "E" pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—40 lbs. at 40 m.p.h.
Adjustment—Side relief valve.
Winter Oil—S.A.E. No. 20W.
Summer Oil—S.A.E. No. 30.

PISTONS

Material—Alum. alloy, T-slot, cam ground.
Clearance—Top—.027"- .033".
Clearance—Bottom—.0024"- .0032".

PISTON RINGS

Gap—Comp., .007"- .015"; Oil, .005"- .015" and .009"- .014".
No. Comp. Rings—2.
Width— $\frac{3}{32}$ ".
No. Oil Rings—2.
Width— $\frac{5}{32}$ " and $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0000"- .0003".
Fit in Rod—.0000"- .0003".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{9}{16}$ ".
Dia. Intake— $1\frac{13}{16}$ ".
Stem Dia.—.34475".
Seat Angle—45°.
Seat Width— $\frac{5}{64}$ max.
Tappet Type—Mushroom.
Clearance—
Hot: Intake—.007"
Exhaust—.008"
For valve timing
.012"
Guides Removable—Yes.
Spring Pressure—Valve closed, 50-54 lbs. at $2\frac{3}{8}$ ".
Valve open, 140 + or - 5 lbs. at $2\frac{1}{16}$.

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ °.
Camber— $1\frac{1}{2}$ °.
Toe-in— $\frac{1}{8}$ ".
Kingpin Angle—8°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Not specified.
Lash—.006"- .008".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Not specified.
Lubricant Capacity—Housing—2 pts., Summer, S.A.E. 160; Winter, S.A.E. 90.

TRANSMISSION

Make and Type—Warner "T-86."
Main Shaft Bearing Type and No.—MRC 208 CFG and 206 FFS.
Countershaft Bearing Type and No.—Bronze, $\frac{3}{4}$ " x $1\frac{1}{8}$ " x $1\frac{1}{16}$ ".

BRAKES

Type—Hydraulic.
Lining Type—Moulded.
Lining Size— $28\frac{1}{4}$ " x $1\frac{1}{4}$ " x $\frac{1}{4}$ ".
Transmission brake, $18\frac{9}{16}$ " x 2" x $\frac{5}{32}$ ".
Adjustments
Cam for clearance.
Eccentric anchor.
Clearance
Top—.010" { Transmission
Bottom—.005" { brake $\frac{1}{32}$ "-.
Brake Effort—50-50.

CLUTCH

Type—B. & B. single plate.
Facing Type—Moulded and woven.
Pilot Bearing Type and No.—.7505" x 1.002" x $1\frac{1}{4}$ ".
Throwout Bearing Type and No.—B. C. A., No. 4506.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent "U" thread.

STEERING GEAR

Type—Cam and lever.
Adjustments
Column end-play—adjusting nut.
Cross-shaft—adjusting screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy 738-K.
Drive—Bendix.
Rotation—Clockwise, viewing pinion.
No Load—65 amps., 5.5 volts at 5000 r.p.m.
Lock Torque—12 ft. lbs., 475 amps., 3.63 volts.
Brush Spring Tension—24.28 oz.

GENERATOR

Make—Delco-Remy 937-Z.
Drive—Belt.
Regulation—Third brush—Step-voltage control optional.
Thermostat—Opens 180°.
Output, cold—Lights off, 18-20 amps., 8.25 volts, 1800 r.p.m.
Lights on—9-11 amps., 8.25 volts, 1800 r.p.m.
Output, hot—Lights off, 15-17 amps., 8.1 $\frac{1}{2}$ m.p.h.
Lights on, 6-8 amps., 8.15 volts, 24 $\frac{1}{2}$ m.p.h.
Brush Spring Tension—Main 22-26 oz., third brush 16-20 oz.
Rotation—Clockwise, viewing drive end.
Cutout to Close—6.75-7.5 volts at 7 m.p.h.
Amps. Discharge to Open—0-2 amps.
Field Fuse—None.

IGNITION

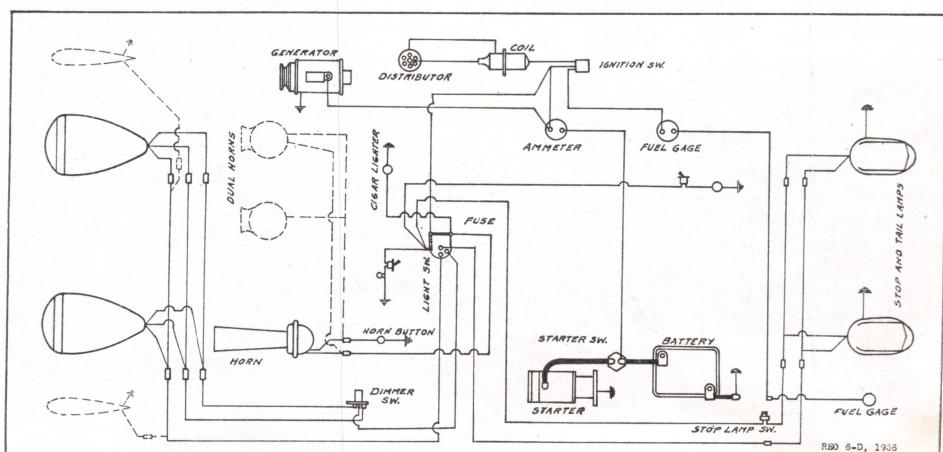
Distributor—Delco-Remy 645-K.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise, viewing drive end.
Breaker Gap—.020".
Brush Spring Tension—17-21 oz.
Spark Plug Gap—.025".
Spark Plug Size—Champion No. 7, 18 m/m.
Manual Advance—None.
Automatic Adv.—18°.
Vacuum Adv.—10°.
Timing—4° or .031" piston travel before top dead center, full retard.
Coil Amps., Engine Idling—2.0 amps.
Coil Amps., Engine Stopped—5.0 amps.

BATTERY

Amps.—102 amp. hr.

LAMPS

Head—No. 2320C.
Park—No. T-55.
Instrument—No. 63.
Fuse—20 amps.
Dome—No. 63.
Stop and Tail—No. 87 and 63.



DeLuxe equipment shown dotted

Studebaker 6, 1938

MODEL 7-A AND COMMANDER 8-A

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{5}{16}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—26.35.
Displacement—226 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—90 at 3400 r.p.m.

CAMSHAFT

Drive—By gears—helical tooth.
Chain Data—Not given.
Valve Timing—Gear marks opposite each other.
Bearings—4—replaceable.
End Thrust Taken On—Thrust plate front end.
Bearung Clearance—Front .00075"—.00225"; others .002"—.00375".

CONNECTING RODS

End Clearance—.005"—.009".
Dia. Clearance—.0005"—.002".

COOLING SYSTEM

Capacity— $14\frac{1}{2}$ qts.
Pump Drive—Fan belt.
Belt Size— $38^{\circ}V - 47\frac{1}{2}'' \times 13\frac{1}{16}''$.
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Steel-backed babbitt.
End Thrust Taken On—Front bearing, adjustable.
End Clearance—.003"—.006".
Dia. Clearance—.0005"—.0025".

FUEL SYSTEM

Carburetor Make—Stromberg BXO-26.
Type—Downdraft single.
Adjustment—Turn out for rich and in for lean mixture.
Fuel Delivery—A. C. camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Spiral gear.
Capacity— $5\frac{1}{2}$ qts.
Oil Pressure—40 lbs. at 25 to 30 m.p.h.
Adjustment—Not given.
Winter Oil—S.A.E. 20; S.A.E. 10 extreme.
Summer Oil—S.A.E. 30; S.A.E. 40 extreme.

PISTONS

Material—Lynite—Tin-plated and cam-ground.
Clearance—Top—.016"—.019" radial.
Clearance—Bottom—.0015" selective.

PISTON RINGS

Gap—Comp. .013"—.018"; Oil .013"—.021".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0001"—.0003" selective.
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $19\frac{1}{32}$ ".
Dia. Intake— $15\frac{1}{32}$ ".
Stem Dia.— $11\frac{1}{32}$ ".
Seat Angle—45°.
Seat Width— $\frac{3}{32}$ ".
Tappet Type—Cylindrical.
Intake—.016" cold.
Exhaust—.020" cold.
.020 cold for valve timing.
Guides Removable—Yes.
Spring Pressure—57-62 lbs. at $28\frac{3}{32}$ ".
125-135 lbs. at $1\frac{1}{4}$ ".

CHASSIS

FRONT AXLE

Caster— $-\frac{1}{4}^{\circ} + \frac{1}{2}^{\circ}$.
Camber— $\frac{1}{2}^{\circ}$ normal.
Toe-in— $\frac{1}{8}'' - \frac{1}{32}''$.
Kingpin Angle— $5\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Spicer semi-floating hypoid.
Pinion Bearing Type—Timken { 02872-02820
{ 31593-31520
Adjustment—Shims.
End Play—Slight drag.
Lash—.003"—.005".
Diff. Bearing Type—Timken No. 25577-25523.
Adjustment—Shims.
End Play—.008"—.010" draw.
Lubricant Capacity—Housing—3 pts.

TRANSMISSION

Make and Type—Warner gear, 3-speed.
Main Shaft Bearing Type and No.—Ball No. 1207.
Countershaft Bearing Type and No.—Bantam roller, No. 22-C-407Q.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Front shoe woven, rear shoe moulded.
Lining Size— $19\frac{11}{16}'' \times 2'' \times \frac{3}{16}''$.
Adjustments—Eccentric for lining clearance.
Eccentric anchor for each shoe.
Clearance
Top—.010" at cylinder head.
Bottom—.005" at anchor.
Brake Effort—55% front, 45% rear.

CLUTCH

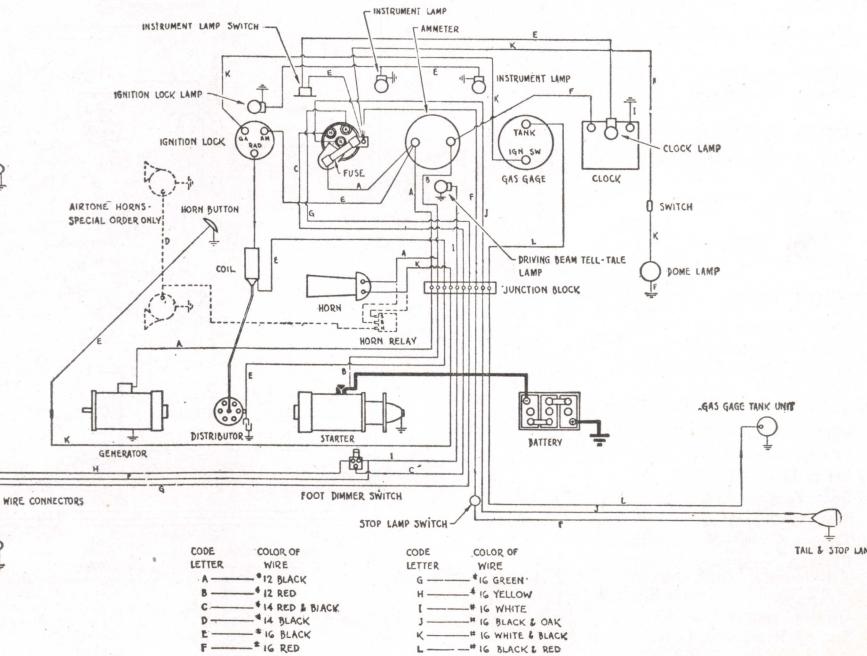
Type—Borg & Beck.
Facing Type—Woven and moulded.
Pilot Bearing Type and No.—Comp. E— $\frac{3}{4}$ " I. D. x $\frac{7}{8}$ " long.
Throwout Bearing Type and No.—Bearings Co. No. 4375A, or Bantam No. 314A.

SPRINGS

Type Front—Transverse semi-elliptic.
Type Rear—Longitudinal semi-elliptic.
Shackle Adjustment—Threaded "U."

STEERING GEAR

Type—Ross cam and twin lever.
Adjustments
Column end play—shims under top cover.
Cross-shaft end play—adjusting screw inside housing cover.
Lubricant—Special steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—60 amps., 5-6 volts at 5000 r.p.m.
Lock Torque—12 ft. lbs., 600 amps., 3 volts.
Brush Spring Tension—42-53 oz., with new brushes.

GENERATOR

Make—Auto-Lite.
Drive—V-belt.
Regulation—3rd brush and voltage regulation.
Thermostat—None.
Output, cold—25 amps. at 8 volts at 2400 r.p.m.
Output, hot—22 amps at 8 volts at 2800 r.p.m.
Brush Spring Tension—24-36 oz. with new brushes.
Rotation—Clockwise viewing drive end.
Cutout to Close—6.4 volts at 7.8 m.p.h.
Amps. Discharge to Open—1.
Field Fuse—5 amps.

IGNITION

Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Counter-clockwise viewed from top.
Breaker Gap—.020".
Brush Spring Tension—16-20 oz.
Spark Plug Gap—.0225"—.0275".
Spark Plug Size—18 m/m Champion No. 8.
Manual Advance—None.
Automatic Adv.—11 degs. cam.
Vacuum Adv.—6 degs. cam.
Timing—2° before top dead center.
Coil Amps., Engine Idling— $\frac{1}{2}$ -1 $\frac{1}{2}$.
Coil Amps., Engine Stopped—4-5.

BATTERY

Amps.—105 amp. hr., Willard.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—30 amps. on light control switch.
Dome—No. 81.
Stop and Tail—No. 1158.

Studebaker Dictator, 1937

MODEL 5-A

ENGINE

DATA

No. of Cylinders—6, Model 5-A.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—25.4.
Displacement—217.8 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—90 at 3400 r.p.m.

CAMSHAFT

Drive—Gears (celeron and cast iron).
Chain Drive—None.
Valve Timing—Mesh punch marks on gears.
Bearings—4, replaceable.
End Thrust Taken On—Thrust plate front end.
Bearing Clearance—Front .00075"-0.00225"; balance .002"-0.00375".

CONNECTING RODS

End Clearance—.005"-0.009".
Dia. Clearance—.0005"-0.002".

COOLING SYSTEM

Capacity—13 qts.
Pump Drive—Belt.
Belt Size— $38\frac{1}{2}$ "V, $44\frac{3}{8}$ "x $\frac{3}{4}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Steel backed babbitt.
End Thrust Taken On—Front.
End Clearance—.003"-0.006".
Dia. Clearance—.0005"-0.0025".

FUEL SYSTEM

Carburetor Make—Stromberg "EX 23".
Type—Downdraft single.
Adjustment—Turn adjusting screw in to lean and out to enrich mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Spiral gear.
Capacity— $5\frac{1}{2}$ qts.
Oil Pressure—40 lbs. at 25.30 m.p.h.
Adjustment—Relief valve.
Oil—
Summer—S.A.E. 30; S.A.E. 40 (extreme).
Winter—S.A.E. 20; S.A.E. 10 (extreme).

PISTONS

Material—Lynite No. 132 T-slot, cam ground.
Clearance—Top—.016"-0.018".
Clearance—Bottom—.0015" selector.

PISTON RINGS

Gap—.013"-0.018".
No. Comp. Rings—2.
Width— $\frac{1}{8}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0001"-0.0003".
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{9}{32}$ ".
Dia. Intake— $1\frac{5}{32}$ ".
Stem Dia.— $1\frac{1}{32}$ ".
Seat Angle—45°.
Seat Width— $\frac{3}{32}$ ".
Tappet Type—Cylindrical.
Clearance—Intake—.016" cold.
Exhaust—.016" cold.
.020" cold for valve timing.
Guides Removable—Yes.
Spring Pressure—
Valve closed, 57-62 lbs. at $28\frac{3}{8}$ ".
Valve open, 125-135 lbs. at $1\frac{3}{4}$ ".

CHASSIS

FRONT AXLE

Caster— $1\frac{1}{2}$ ".
Camber— $1\frac{1}{2}$ ".
Toe-in— $\frac{1}{16}$ "-.
Kingpin Angle— $9\frac{1}{2}$ ".
Tie Rod Adj.—Thread.

REAR AXLE

Type—Spicer, semi-floating hypoid.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Adjust to slight drag.
Lash—.005"-0.007".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Adjust to slight drag.
Lubricant—Housing—3 pts. special hypoid lubricant.

TRANSMISSION

Make and Type—Warner gear 3-speed, helical gears.
Main Shaft Bearing Type and No.—Federal No. 1207.
Countershaft Bearing Type and No.—Bantam C407Q.

BRAKES

Type—Lockheed Hydraulic.
Lining Type—Front shoe woven, rear shoe moulded.
Lining Sizes— $19\frac{11}{16}$ "x $1\frac{3}{4}$ "x $\frac{3}{16}$ ".
Adjustments—Cam adjustment for lining wear. Eccentric anchor adjustment.
Clearance—Top—.010".
Bottom—.005".
Brake Effort—55% front; 45% rear.

CLUTCH

Type—B. & B. single plate.
Facing Type—Moulded and woven.
Pilot Bearing Type and No.— $\frac{3}{4}$ "x $\frac{7}{8}$ " Compo. E.
Throwout Bearing Type and No.—BCA-403A.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Threaded "U".

STEERING GEAR

Type—Ross cam and twin lever.
Adjustments—
Column end play—shims under top cover.
Cross shaft end play—adjusting screw in side cover.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Over running clutch.
Rotation—Clockwise, viewing drive end.
No. Load—60 amp., 5 to 6 volts, 5000 r.p.m.
Lock Torque—16 ft. lbs., 640 amps., 3.2 vols.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Auto-Lite.
Drive—V-Belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—
Lights off, 19 amps., 6- $\frac{1}{2}$ vols., 2000 r.p.m.
Lights on, 10 amps., 6- $\frac{1}{2}$ vols., 2000 r.p.m.
Output, hot—
Lights off, 17 amps., 6- $\frac{1}{2}$ vols., 20.6 m.p.h.
Lights on, 8 amps., 6- $\frac{1}{2}$ vols., 20.6 m.p.h.
Brush Spring Tension—18-22 oz.
Rotation—Clockwise, viewing from drive end.
Cutout to Close—6.4 volts at 7 to 8 m.p.h.
Amps. Discharge to Open—1.
Field Fuse— $7\frac{1}{2}$ amps.

IGNITION

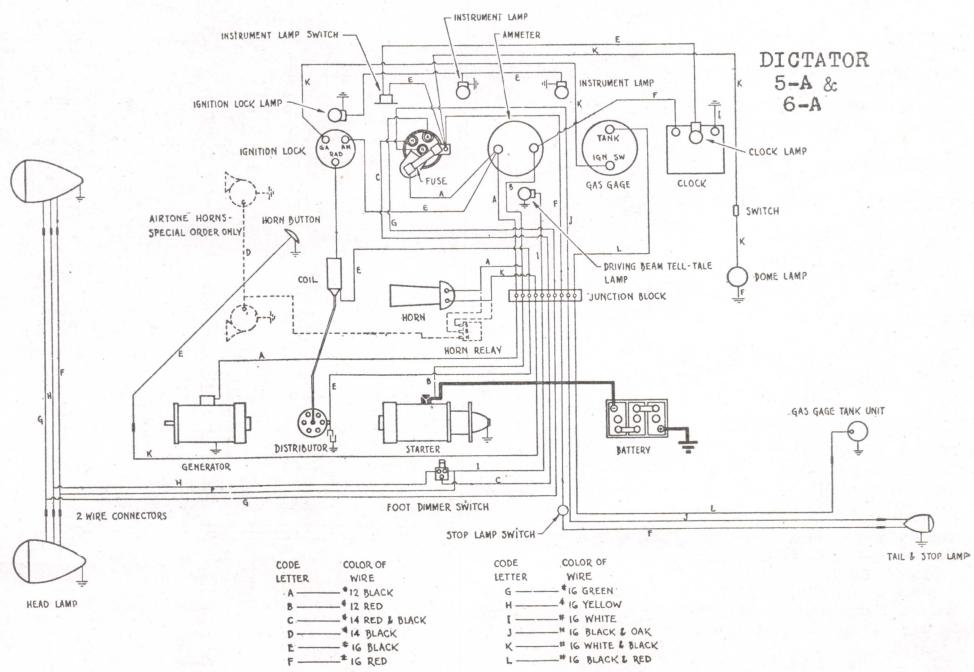
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.020".
Brush Spring Tension—16-20 oz.
Spark Plug Gap—.0225"-0.0275".
Spark Plug Size—18 m/m Champion No. 8.
Manual Advance—None.
Automatic Advance—21° max.
Vacuum Advance—12° max.
Timing— $\frac{3}{4}$ " before upper dead center in vibration dampener.
Coil Amps., Engine Idling— $\frac{1}{2}$ -1 $\frac{1}{2}$.
Coil Amps., Engine Stopped—4.5.

BATTERY

Amps—Willard 105 amp. hrs.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—30 amps.
Dome—No. 8.
Stop and Tail—No. 1158.



Studebaker President 1937

MODEL 3-C

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{16}$ "
Stroke— $\frac{4}{5}$ ".
Taxable H. P.—30.0.
Displacement—250.4 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—115 at 3600 r. p. m.

CAMSHAFT

Drive—Gears.
Valve Timing—Mesh punch marks on gears.
Bearings—6, replaceable.
End Thrust Taken On—Thrust plate, front end.
Bearing Clearance—Front, .00075"-.00225"; balance, .002"-.00375".

CONNECTING RODS

End Clearance—.005"-.010".
Dia. Clearance—.00075"-.00275".

COOLING SYSTEM

Capacity—16 qts.
Pump Drive—Generator coupling.
Belt Size— $38^{\circ}V$ — $49\frac{1}{4}$ " x $2\frac{7}{32}$ ".
Belt Adjustment—Fan mounting.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—9.
Material—Steel baked babbitt.
End Thrust Taken On—Front.
End Clearance—.003"-.006".
Dia. Clearance—.001"-.003".

FUEL SYSTEM

Carburetor Make—Stromberg "EE1".
Type—Down draft dual.
Adjustment—Turn adjustment in to lean and out to enrich mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Spiral gear.
Capacity—8 qts.
Oil Pressure—40 lbs. at 25-30 m. p. h.
Adjustment—Relief valve.
Winter Oil—S.A.E. No. 20; S.A.E. No. 10 (extreme).
Summer Oil—S.A.E. No. 30; S.A.E. No. 40 (extreme).

PISTONS

Material—Lynite No. 132, T-slot, cam ground.
Clearance—Top—.015"-.018".
Bottom—.0015" selective.

PISTON RINGS

Gap—Comp. .013"-.018"; oil .013"-.021".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Clamped in rod.
Fit in Piston—.0001"-.0003".
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{5}{32}$ ".
Dia. Intake— $1\frac{13}{32}$ ".
Seat Dia.— $1\frac{1}{8}$ ".
Seat Angle— 45° .
Seat Width— $\frac{3}{32}$ ".
Tappet Type—Mushroom.
Clearance—Intake—.016" cold.
.020" cold for valve timing.
Exhaust—.016" cold.
Guides Removable—Yes.
Spring Pressure—57-62 lbs. at $2\frac{3}{32}$ ".
125-135 lbs at $1\frac{3}{4}$ ".

CHASSIS

FRONT AXLE

Caster— $\frac{1}{4}^{\circ}$ + $\frac{1}{2}^{\circ}$.
Camber— $\frac{1}{2}$ normal.
Toe-in— $\frac{1}{16}$ " - $\frac{1}{8}$ ".
Kingpin Angle— $5\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Spicer semi-floating, hypoid.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play—Adjust to slight drag.
Lash—.003"-.005".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Adjust to slight drag.
Lubricant Capacity—Housing— $3\frac{1}{2}$ pts., special hypoid lubricant.

TRANSMISSION

Make and Type—Warner gear, 3 speed, helical gears.
Main Shaft Bearing Type and No.—Federal 1208.
Countershaft Bearing Type and No.—Hyatt R. A. 145.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Front shoe, woven; rear shoe, moulded.
Lining Size— $21\frac{1}{2}^{\prime\prime} \times 1\frac{3}{4}^{\prime\prime} \times \frac{1}{4}^{\prime\prime}$.
Adjustments
Cam adjustment for lining wear.
Eccentric anchor adjustment.
Clearance—Top—.010".
Bottom—.005".
Brake Effort—55% front; 45% rear.

CLUTCH

Type—Long, single plate.
Facing Type—Moulded.
Pilot Bearing Type and No.—Hyatt No. 13032.
Throwout Bearing Type and No.—Bantam R-154A.

SPRINGS

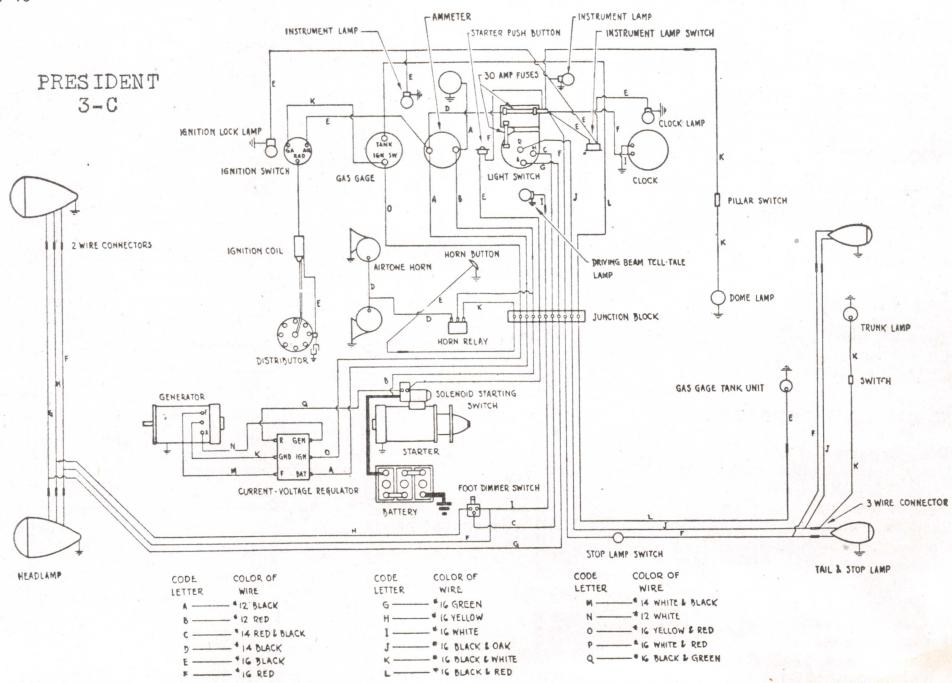
Type Front—Transverse semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Harris rubber.

STEERING GEAR

Type—Ross cam and twin lever.

Adjustments
Column end play, shims under top cover.
Cross-shaft end play, adjusting screw in side cover.
Lubricant—Steering gear lubricant.

PRESIDENT 3-C



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy.
Drive—Over-running clutch.
Rotation—Clockwise, viewing drive end.
No Load—60 amps., 5-6 volts, 5000 r. p. m.
Lock Torque—15 ft. lbs., 575 amps., 3.2 volts.

GENERATOR

Make—Delco-Remy.
Drive—Gear.
Regulation—Voltage regulator.
Thermostat—None.
Output, cold—Lights off, 21 amps., 6-8½ volts, 37 m. p. h.
Lights on, 12 amps., 6-8½ volts, 37 m. p. h.
Output, hot—Lights off, 17 amps., 6-8½ volts, 37 m. p. h.
Lights on, 8 amps., 6-8½ volts, 37 m.p.h.
Rotation—Clockwise, viewing drive end.
Cutout to close—6.4 volts at $9\frac{1}{4}$ m. p. h.
Amps. Discharge to Open—1.
Field Fuse—1.

IGNITION

Distributor—Delco-Remy.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.020".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.0225"-.0275".
Spark Plug Size—18 m/m Champion No. 8.
Manual Advance—None.
Automatic Advance— 27° maximum.
Vacuum Advance— 12° maximum.
Timing—at top dead center.
Coil Amps., Engine Idling— $\frac{1}{2}$ - $1\frac{1}{2}$.
Coil Amps., Engine Stopped—4-5.

BATTERY

Amps.—105 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—30 amps.
Stop and Tail—No. 1158.
Dome—No. 81.

INSTRUMENT LAMP

Instrument Lamp Switch

DRIVING BEAM TELL-TALE LAMP

Junction Block

DOME LAMP

Junction Block

TRUNK LAMP

Junction Block

GAS GAGE TELL-TALE UNIT

Junction Block

STOP LAMP SWITCH

Junction Block

TAIL & STOP LAMP

Junction Block

Studebaker Dictator, 1936

Model 3A Standard Front Axle; Model 4A Independent Wheel Suspension

ENGINE

DATA

No. of Cylinders—6.
Bore— $3\frac{1}{4}$ ".
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—25.4.
Displacement—217.8 cu. in.
Firing Order—1-5-3-6-2-4.
Max. H. P.—90 at 3400 r.p.m.

CAMSHAFT

Drive—Helical gear.
Chain Data—Not given.
Valve Timing—Marks on timing gears in line opposite each other.
Bearings—4—Split, steel backed, babbitt lined.
End Thrust Taken On—Thrust plate, front end.
Bearing Clearance—Front .00075"—.00225"; others .002"—.00375".

CONNECTING RODS

Spun babbitt bearings.
End Clearance—.005"—.009".
Dia. Clearance—.0005"—.002".

COOLING SYSTEM

Capacity—14 qts.
Pump Drive—Fan belt.
Belt Size— $38^{\prime\prime}$ V— $44\frac{3}{8}^{\prime\prime}$ x $\frac{3}{4}$ "
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—4.
Material—Steel backed, babbitt lined.
End Thrust Taken On—Front bearing.
End Clearance—.003"—.006".
Dia. Clearance—.0005"—.0025".

FUEL SYSTEM

Carburetor Make—Stromberg "EX2."
Type—Down-draft single.
Adjustment—Idle—turn out to enrich; in to lean.
High-speed, fixed jets.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—6 qts.
Oil Pressure—Min. high speed 40 lbs.
Adjustment—Not given.

Oil	0° F. or below..	S.A.E. No. 10
	0° F. to 45° F..	S.A.E. No. 20
	45° F. to 90° F..	S.A.E. No. 30
Above 90° F. (high speed).....	S.A.E. No. 40	

PISTONS

Material—Alum. alloy, cam ground.
Clearance—Top—Not specified.
Clearance—Bottom—7-15 lbs. pull on $1^{\prime\prime}$ x .002" feeler.

PISTON RINGS

Gap—.013"—.018".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0001"—.0003"
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{9}{32}$ ".
Dia. Intake— $1\frac{15}{32}$ ".
Stem Dia.— $1\frac{1}{2}$ ".
Seat Angle—45°.
Seat Width— $\frac{3}{8}$ ".
Tappet Type—Cylindrical.
Clearance—Intake—Cold .016".
Exhaust—Cold .016".
Guides Removable—Yes.
Spring Pressure—125-135 lbs. at $1\frac{3}{4}$ ", valve open.

CHASSIS

FRONT AXLE

Caster—3A— $\frac{1}{2}^{\circ}$ - $1\frac{1}{2}^{\circ}$; 4A— $\frac{1}{4}^{\circ}$ - $+\frac{1}{2}^{\circ}$.
Camber—3A— -1° - $1\frac{1}{2}^{\circ}$; 4A— $-1\frac{1}{2}^{\circ}$.
Toe-in—3A— $\frac{1}{16}^{\prime\prime}$ - $\frac{1}{8}^{\prime\prime}$; 4A— $\frac{1}{16}^{\prime\prime}$.
Kingpin Angle— $9\frac{1}{2}^{\circ}$.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given (slight drag specified).
Lash—.002"—.004".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $2\frac{1}{2}$ pts.
Summer—S.A.E. No. 110.
Winter—S.A.E. No. 90.

TRANSMISSION

Make and Type—Synchro-mesh with over-drive. Optional.
Main Shaft Bearing Type and No.—Fed. No. 1207.
Countershaft Bearing Type and No.—Ban. C 407 Q.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Woven.
Lining Size— $23^{\prime\prime}$ x $1\frac{3}{4}^{\prime\prime}$ x $\frac{1}{4}^{\prime\prime}$.
Adjustments—Cam for clearance.
Eccentric anchor.
Clearance
Top—.010".
Bottom—.005".
Brake Effort—55% front, 45% rear.

CLUTCH

Type—B. & B. single plate.
Facing Type—Composition.
Pilot Bearing Type and No.—Durex $\frac{3}{4}^{\prime\prime}$ x $\frac{1}{8}^{\prime\prime}$.
Throwout Bearing Type and No.—BCA, 4038A.

SPRINGS

Type Front—3A, semi-elliptic; 4A, semi-elliptic, transverse.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Cam and lever.
Adjustments
Column end play—adjusting nut.
Cross-shaft—adjusting screw.
Lubricant—Special steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—60 amps., 5 volts, 5000 r.p.m.
Lock Torque—16 ft. lbs., 640 amps., 3.2 volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Auto-Lite.
Drive—Belt.
Regulation—Third brush and voltage regulation.
Thermostat—None.
Output, cold—19 amps., 6 to 8.5 volts, at 2000 r.p.m.
Output, hot—17 amps., 6 to 8.5 volts, at 2000 r.p.m.
Brush Spring Tension—18-22 oz.
Rotation—Not given.
Cutout to close—6.4 volts at 7 to 8 m.p.h.
Amps. Discharge to Open—1.0.
Field Fuse—5 amps.

IGNITION

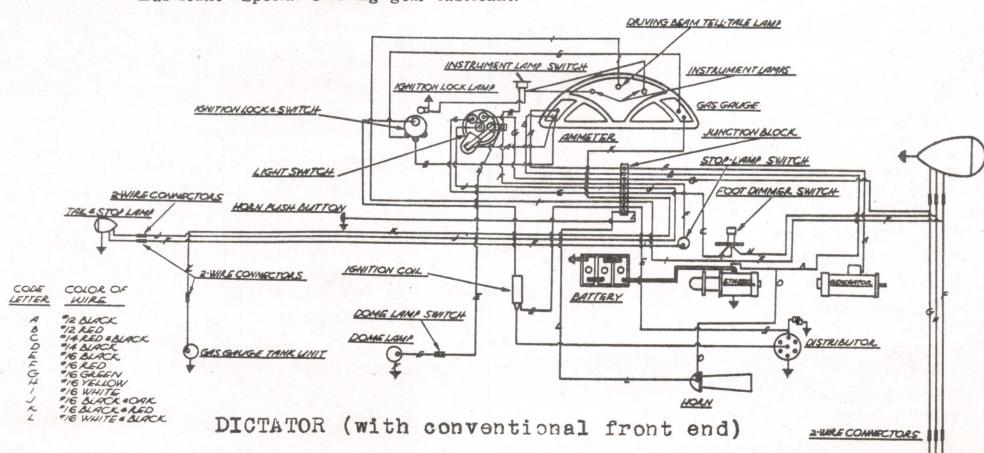
Distributor—Auto-Lite.
Coil—Auto-Lite.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.020".
Brush Spring Tension—16-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—Champion 18 m/m.
Manual Advance—None.
Automatic Advance—21°.
Timing— $\frac{5}{64}$ " before top dead center on vibration damper flywheel.
Coil Amps., Engine Idling—0.5.
Coil Amps., Engine Stopped—4.0.

BATTERY

Amps.—102 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—30 amps.
Dome—No. C 81.
Stop and Tail—No. 1158.



Studebaker President, 1936

ENGINE

DATA

No. of Cylinders—8.
Bore— $3\frac{1}{16}$ ".
Stroke— $4\frac{1}{4}$ ".
Taxable H. P.—30.0.
Displacement—250.4 cu. in.
Firing Order—1-6-2-5-8-3-7-4.
Max. H. P.—115 at 3600 r.p.m.

CAMSHAFT

Drive—Helical gear.
Chain Data—Not given.
Valve Timing—Marks on timing gears in line opposite each other.
Bearings—6, split steel backed, babbitt lined.
End Thrust Taken On—Thrust plate, front end.
Bearing Clearance—Front .00075"-0.00225"; others .002"-0.00375".

CONNECTING RODS

Steel backed, lead bronze, removal bearings.
End Clearance—.005"-0.010".
Dia. Clearance—.00075"-0.00275".

COOLING SYSTEM

Capacity—17 qts.
Pump Drive—Accessory drive shaft.
Belt Size— $38^{\circ}V - 49\frac{1}{4}'' \times 27\frac{3}{8}''$.
Belt Adjustment—Fan mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—9.
Material—Babbitt lined, interchangeable.
End Thrust Taken On—Front bearing.
End Clearance—.003"-0.006".
Dia. Clearance—.001"-0.003".

FUEL SYSTEM

Carburetor Make—Stromberg.
Type—Downdraft dual.
Adjustment—Idle—turn out to enrich—in to lean.
High-speed fixed jets.
Fuel Delivery—A. C. pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—8 qts.
Oil Pressure—Min. high speed 40 lbs.
Adjustment—Not given.

Winter Oil	0° F. or below.. S.A.E. No. 10
	0 $^{\circ}$ F. to 45 $^{\circ}$ F.. S.A.E. No. 20
Summer Oil	Above 45 $^{\circ}$ F. to 90 $^{\circ}$ F.. S.A.E. No. 30
	Above 90 $^{\circ}$ F. (high speed)..... S.A.E. No. 40

PISTONS

Material—Alum. alloy, cam ground.
Clearance—Top—Not specified.
Clearance—Bottom—7-15 lbs. pull on 1" x 0.003" feeler.

PISTON RINGS

Gap—.013"-0.018".
No. Comp. Rings—2.
Width— $\frac{1}{16}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Locked in rod.
Fit in Piston—.0001"-0.0003".
Fit in Rod—Clamp fit.

VALVES AND TAPPETS

Dia. Exhaust— $19\frac{1}{32}$ ".
Dia. Intake— $11\frac{1}{32}$ ".
Seat Dia.— $1\frac{1}{32}$ ".
Seat Angle—45°.
Seat Width— $\frac{3}{32}$ ".
Tappet Type—Mushroom.
Clearance—Intake—Cold .016".
Exhaust—Cold .016".
Guides Removable—Yes.
Spring Pressure—125-135 lbs. at $1\frac{1}{4}$ ", valve open.

CHASSIS

FRONT AXLE

Caster— $\frac{1}{4}^{\circ}$ + $\frac{1}{2}^{\circ}$.
Camber— $1\frac{1}{2}^{\circ}$.
Toe-in— $\frac{3}{16}$ ".
Kingpin Angle—9 $\frac{1}{2}^{\circ}$.
Tie Rod Adjustment—Thread.

REAR AXLE

Type—Semi-elliptic, spiral bevel.
Pinion Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given (slight drag specified).
Lash—.002"-0.004".
Diff. Bearing Type—Taper roller.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing—4 pts.
Summer—S.A.E. No. 110.
Winter—S.A.E. No. 90.

TRANSMISSION

Make and Type—Synchro-mesh with overdrive (optional).
Main Shaft Bearing Type and No.—Fed. No. 1208 and 1209.
Countershaft Bearing Type and No.—Hyatt, R. A. 145.

BRAKES

Type—Lockheed hydraulic.
Lining Type—Woven.
Lining Size— $25'' \times 1\frac{3}{4}'' \times \frac{1}{4}''$.
Adjustments—Cam for clearance.
Eccentric anchor.
Clearance
Top—.010".
Bottom—.005".
Brake Effort—55% front, 45% rear.

CLUTCH

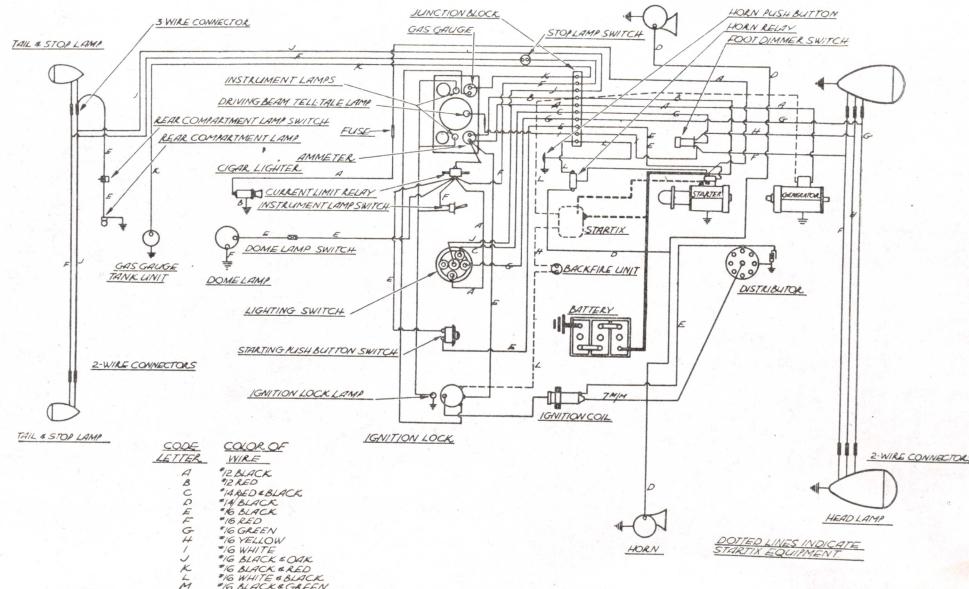
Type—Long single plate.
Facing Type—Composition.
Pilot Bearing Type and No.—Hyatt No. 13032.
Throwout Bearing Type and No.—Ban. R. 154A.

SPRINGS

Type Front—Semi-elliptic, transverse.
Type Rear—Semi-elliptic.
Shackle Adjustment—Thread.

STEERING GEAR

Type—Ross, cam and lever.
Adjustments
Column end-play—adjusting nut.
Cross-shaft—adjusting screw.
Lubricant—Special steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Delco-Remy.
Drive—Bendix.
Rotation—Clockwise viewing drive end.
No Load—60 amps., 5 volts, 5000 r.p.m.
Lock Torque—15 ft. lbs., 575 amps., 3.2
volts.
Brush Spring Tension—24-28 oz.

GENERATOR

Make—Delco-Remy.
Drive—Belt.
Regulation—Third brush and voltage control.
Thermostat—None.
Output; cold—21 amps., 6 to 8.5 volts, 2800
r.p.m.
Output, hot—17 amps., 6 to 8.5 volts, 2800
r.p.m.
Brush Spring Tension—14-18 oz.
Rotation—Not specified.
Cutout to Close—6.4 volts at 9.25 m.p.h.
Amps. Discharge to Open—1.0.
Field Fuse—None.

IGNITION

Distributor—Delco-Remy.
Coil—Delco-Remy.
Distr. Rotation—Counter-clockwise.
Breaker Gap—.020".
Brush Spring Tension—19-23 oz.
Spark Plug Gap—.025".
Spark Plug Size—Champion 18m/m.
Manual Advance—None.
Automatic Advance—27° crankshaft.
Timing—Top dead center.
Coil Amps., Engine Idling—0.5.
Coil Amps., Engine Stopped—4.0.

BATTERY

Amps.—102 amp. hr.

LAMPS

Head—No. 2331.
Park—No. 55.
Instrument—No. 51.
Fuse—Current limit relay.
Dome—No. C81.
Stop and Tail—No. 1158.

Willys, 1938

MODEL 38

ENGINE

DATA

No. of Cylinders—4.
Bore— $3\frac{1}{8}$ ".
Stroke— $4\frac{1}{8}$ ".
Taxable H. P.—15.63.
Displacement—134.2 cu. in.
Firing Order—1-3-4-2.
Max. H. P.—48 at 3200 r.p.m.

CAMSHAFT

Drive—Link belt chain.
Chain Data—47 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marks in line opposite each other.
Bearings—4, front removal only.
End Thrust Taken On—Spring loaded plunger.
Bearing Clearance—.0015"- .0025".

CONNECTING RODS

End Clearance—.004"- .009".
Dia. Clearance—.001".

COOLING SYSTEM

Capacity—Not given.
Pump Drive—Fan belt.
Belt Size— $42\frac{1}{2}$ " V— $42\frac{1}{2}$ " x $2\frac{1}{2}$ ".
Belt Adjustment—Generator mounting.
Pump Pack. Adj.—Thread.

CRANKSHAFT

No. Bearings—3.
Material—Steel back, babbitt lined.
End Thrust Taken On—Front bearing.
End Clearance—.004"- .006".
Dia. Clearance—.001"- .0025".

FUEL SYSTEM

Carburetor Make—Tillotson U-I-A.
Type— $1\frac{1}{8}$ " downdraft, single.
Adjustment—Idle, 1 turn open; out, rich.
High speed $2\frac{3}{4}$ turns open; turning out gives richer mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Internal gear.
Capacity—4 qts.
Oil Pressure—30 lbs. at 30 m.p.h.
Adjustment—Shims under relief valve spring.
Winter Oil—20W; Extra Winter 10W.
Summer Oil—S.A.E. 30.

PISTONS

Material—Cast-iron, light weight.
Clearance—Top—.016".
Clearance—Bottom—.0025"- .003".

PISTON RINGS

Gap—Top .010"- .008"; .013" all other rings.
No. Comp. Rings—3.
Width— $\frac{3}{32}$ ".
No. Oil Rings—1.
Width— $\frac{3}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0002"- .0004".
Fit in Rod—.0004"- .0006".

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{32}$ ".
Dia. Intake— $1\frac{17}{32}$ ".
Stem Dia.— $37\frac{1}{16}$ "-.372".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Mushroom.
Clearance—Hot:
Intake —.004" { .010" cold for
Exhaust—.006" } valve timing.
Guides Removable—Yes.
Spring Pressure— $46\frac{1}{2}$ lbs. at $2\frac{1}{4}$ ".
 $85\frac{1}{2}$ lbs. at $1\frac{15}{16}$ ".

CHASSIS

FRONT AXLE

Caster—3°.
Camber—2° or $2\frac{1}{2}$ °.
Toe-in— $\frac{3}{32}$ ".
King Pin Angle—7½°.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Semi-floating, spiral bevel.
Pinion Bearing Type—Timken { 02474-02420
3193-3120
Adjustment—Shims.
End Play—1" resistance at 15" leverage.
Lash—.005"- .010" measured at outside of ring gear.
Diff. Bearing Type—Timken 16284-16150.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $1\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Warner Model T84C.
Main Shaft Bearing Type and No.—Federal
No. 1207 and 1305 C.G.F.
Countershaft Bearing Type and No.—Bronze
bushing.

BRAKES

Type—Bendix mechanical.
Lining Type—Moulded.
Lining Size— $19\frac{1}{16}$ " x $1\frac{1}{4}$ " x $\frac{3}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Sliding type anchor.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—45% front; 55% rear.

CLUTCH

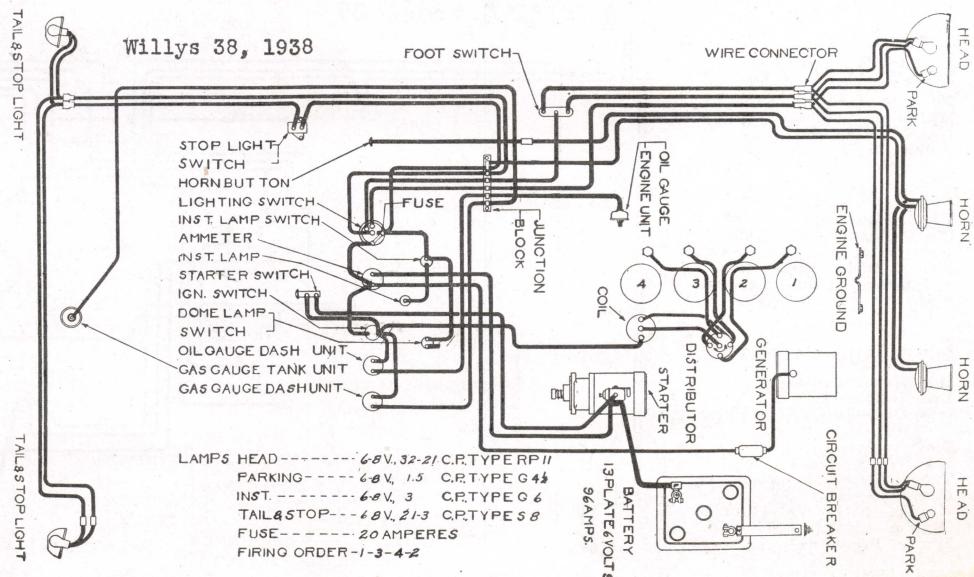
Type—Rockford (B. & B.) disc.
Facing Type—Moulded.
Pilot Bearing Type and No.—Bronze.
Throwout Bearing Type and No.—Bearings
Co. No. 4768A.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent "U."

STEERING GEAR

Type—Gemmer worm and sector.
Adjustments—Not given.
Lubricant—Special steering gear lubricant.



ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite—MZ 4049.
Drive—Bendix.
Rotation—Clockwise, viewing pinion.
No. Load—70 amps. max., 5.5 volts at 4300
r.p.m.
Lock Torque—11.8 ft. lbs., 400 amps., 4
volts.
Brush Spring Tension—40-44 oz.

GENERATOR

Make—Auto-Lite—GAM 4505.
Drive—Fan belt.
Thermostat—None.
Regulation—Third brush.
Output, cold—17 amps. at 8 volts at 2400
gen. r.p.m.
Output, hot— $12\frac{1}{2}$ amps. at 8 volts at 2350
r.p.m.
Brush Spring Tension—18-22 oz.
Rotation—Counter-clockwise, viewing drive
end.
Cutout to Close—7 to 7.5 volts at 12 m.p.h.
Amps. Discharge to Open—0.5-2.5.
Field Fuse—None.

IGNITION

Distributor—Auto-Lite—IGS 4007.
Coil—Auto-Lite—IG 4090.
Distr. Rotation—Clockwise, viewed from top.
Breaker Gap—.020".
Brush Spring Tension—16-20 oz.
Spark Plug Gap—.025".
Spark Plug Size—18 m/m Champion "C7."
Manual Advance—None.
Automatic Advance—28 degs. at 3400 r.p.m.
Vacuum Advance—20 degs.
Timing—5 degs. or .0103" piston travel after
top dead center.
Coil Amps., Engine Idling—2.5 at 6 volts
and 400 r.p.m.
Coil Amps., Engine Stopped—4 at 7.8 volts.

BATTERY

Amps.—96 amp. hr.

LAMPS

Head—No. 2320.
Park—No. 55.
Instrument—3 c. p.—6-8 v.
Fuse—20 amps.
Dome—Not specified.
Stop and Tail—21 and 3 c. p.—6-8 v.

Willys, 1937

MODEL 37

ENGINE

DATA

No. of Cylinders—4.
Bore— $3\frac{1}{8}$ "
Stroke— $4\frac{3}{8}$ ".
Taxable H. P.—15.63.
Displacement—134.2 cu. in.
Firing Order—1-3-4-2.
Max H. P.—48 at 3200 r.p.m.

CAMSHAFT

Drive—Link belt chain.
Chain Data—47 links, $1\frac{1}{4}$ " wide, $\frac{1}{2}$ " pitch.
Valve Timing—Sprocket marking; intake opens on top dead center.
Bearings—4; front removable only.
End Thrust Taken On—Spring loaded plunger.
Bearing Clearance—.0015"--.0025".

CONNECTING RODS

End Clearance—.006"--.008".
Dia. Clearance—.002".

COOLING SYSTEM

Capacity—11 qts.
Pump Drive—Fan belt.
Belt Size— $42^{\circ}V$ — $421\frac{1}{2}^{\circ} \times 2\frac{1}{2}$ ".
Belt Adjustment—Generator mounting.
Pump Pack Adj.—Thread.

CRANKSHAFT

No. Bearings—3.
Material—Hard metal back babbitt lined.
End Thrust Taken On—Front bearing.
End Clearance—.004"--.006".
Dia. Clearance—.002".

FUEL SYSTEM

Carburetor Make—Tillotson U-AU-1A.
Type—Downdraft single.
Adjustment—Idle, $\frac{3}{4}$ -1 turn open; out, rich.
High speed, $\frac{3}{4}$ turn, open; turning out gives rich mixture.
Fuel Delivery—Camshaft pump.

LUBRICATION

Type—Pressure.
Pump Type—Gear.
Capacity—4 qts.
Oil Pressure—30 lbs. at 30 m.p.h., warm oil.
Adjustment—Shims under relief valve spring.
Oil { Summer S.A.E. No. 30
Winter, Mild S.A.E. No. 20W
Winter, Severe S.A.E. No. 10W.

PISTONS

Material—Light weight semi-steel.
Clearance—Top—.007".
Clearance—Bottom—.0025".

PISTON RINGS

Gap—Comp., .007"-.012"; oil, .007"-.015".
No. Comp. Rings—3.
Width— $3\frac{1}{8}$ ".
No. Oil Rings—1.
Width— $3\frac{1}{16}$ ".

PISTON PINS

Type—Floating.
Fit in Piston—.0002"--.0004"
clearance, hand pressure fit.
Fit in Rod—.0004"--.0006"
clearance, thumb pressure fit.

VALVES AND TAPPETS

Dia. Exhaust— $1\frac{15}{16}$ ".
Dia. Intake— $1\frac{7}{8}$ ".
Stem Dia.—Int., $.372$ "; Exh., .371".
Seat Angle—45°.
Seat Width— $\frac{1}{16}$ ".
Tappet Type—Mushroom.
Clearance—Hot:
Intake—.004" { Valve tappet
Exh.—.006" { .010" cold.
Spring Pressure—
46 lbs. at $2\frac{1}{4}$ ".
 $8\frac{1}{2}$ lbs. at $1\frac{15}{16}$ ".
Free length $2\frac{1}{16}$ ".

CHASSIS

FRONT AXLE

Caster—3°.
Camber—2° or $2\frac{1}{2}$ °.
Toe-in— $\frac{3}{32}$ ".
Kingpin Angle— $7\frac{1}{2}$ °.
Tie Rod Adj.—Thread.

REAR AXLE

Type—Spiral bevel, semi-floating.
Pinion Bearing Type—Timken.
Adjustment—Shims.
End Play— $1\frac{1}{2}$ " resistance at 15" leverage.
Lash—.005"--.010".
Diff. Bearing Type—Timken.
Adjustment—Shims.
End Play—Not given.
Lubricant Capacity—Housing— $1\frac{1}{4}$ pts.

TRANSMISSION

Make and Type—Warner T 84 C. synchromesh.
Main Shaft Bearing Type and No.—No. 1207 and 1305 CGF.
Countershaft Bearing Type and No.—Graphite bronze.

BRAKES

Type—Bendix mechanical.
Lining Type—Moulded.
Lining Size— $19\frac{1}{16}$ " x $1\frac{1}{4}$ " x $\frac{9}{16}$ ".
Adjustments—Eccentric for centralizing.
Adjusting screw for clearance.
Sliding anchor adjustment.
Clearance—Top—.010".
Bottom—.010".
Brake Effort—45% front; 55% rear.

CLUTCH

Type—Single plate; Rockford—Borg & Beck.
Facing Type—Moulded.
Pilot Bearing Type and No.—Bronze.
Throwout Bearing Type and No.—B. C. A. ball.

SPRINGS

Type Front—Semi-elliptic.
Type Rear—Semi-elliptic.
Shackle Adjustment—Silent-U.

STEERING GEAR

Type—Gemmer worm and gear.
Adjustments
Column end play—shims.
Cross-shaft—adjusting screw.
Lubricant—Steering gear lubricant.

ELECTRICAL DATA

STARTING MOTOR

Make—Auto-Lite No. MZ 4049.
Drive—Bendix.
Rotation—Clockwise, viewing pinion.
No Load—With drive, 70.0 amps. max., 5.5 volts, 4300 r.p.m.
Lock Torque— $12\frac{1}{4}$ ft lbs. at 4 volts, 540 amps.
Brush Spring Tension—40.44 oz.

GENERATOR

Make—Auto-Lite No. GAM 4504.
Drive—Fan belt.
Regulation—Third brush.
Thermostat—None.
Output, cold—17 amps. at 8 volts at 2400 generator r.p.m.
Output, hot— $12\frac{1}{2}$ amps. at 8 volts at 22 m.p.h.
Brush Spring Tension—18.22 oz.
Rotation—Counter-clockwise, viewing drive end.
Cutout to Close—7 to 7.5 volts at 995 r.p.m.
Amps. Discharge to Open—0.5 to 2.5.
Field Fuse—None.

IGNITION

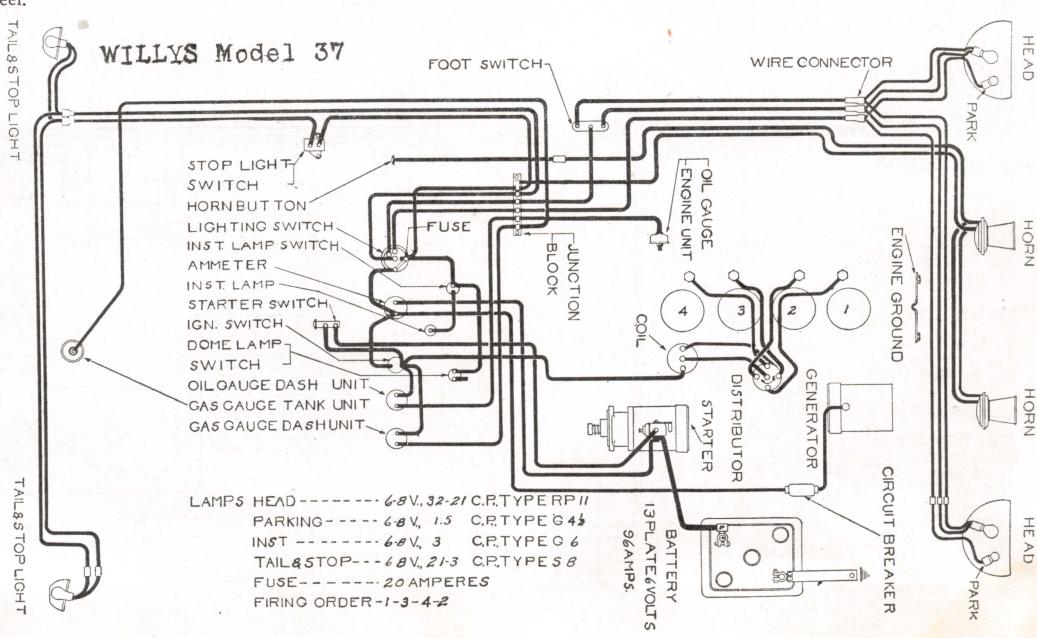
Distributor—Auto-Lite No. IGS 4007.
Coil—Auto-Lite No. IG 4090.
Distr. Rotation—Clockwise, viewed from top.
Breaker Gap—.018".
Brush Spring Tension—16.20 oz.
Spark Plug Gap—.025".
Spark Plug Size—18 m/m.
Manual Advance—None.
Automatic Advance— 25° at 3400 r.p.m.
Vacuum Advance— 23° .
Timing— 5° or $.0103"$ piston travel after center with automatic spark advance at rest.
Coil Amps., Engine Idling—2.5 at 6 volts and 400 r.p.m.
Coil Amps., Engine Stopped—4 at 78° Fahr.

BATTERY

Amps.—U. S. L., 95 amp. hrs.

LAMPS

Head—2320.
Park—55 (in headlamp).
Instrument—3 C. P.—6.8 volt.
Fuse—20 amps.
Dome—Not specified.
Stop and Tail—21 and 3 C. P.—6.8 volt.



How to Read a Wiring Diagram

*A discussion of circuits
for the various units with
definition of symbols used*

By T. C. STEWART

UNDERSTANDING the various circuits of a motor vehicle electrical system as shown on wiring diagrams may not be simple. An important fundamental in tracing circuits is that the circuit is not complete until a return to the source of power is provided. We may define the circuit as a regular or appointed route from point to point—the complete path or extension, any part of the path of current including the source. The word circuit itself suggests a circle and actually the entire electrical system of the car comprises nothing more than a group of such circles or circuits.

Every circuit must have a source of electrical energy or power and a means of controlling the power or current in the circuit, that is, a means of breaking the circuit. The switch is the means of breaking or completing the circuit as desired, while for this discussion we can consider the battery as the source of current.

In Fig. 1-A, is combined the circle which represents the circuit, a battery which is the source of electrical energy and a switch for breaking the circuit. When the switch is closed, the circuit is completed; when the switch is open, the circuit is broken. In this circle we can connect any number of electrical devices and when connected as shown in Fig. 1-B, the devices are said to be connected in parallel. When connected as shown in Fig. 1-C, they are said to be connected in series. If the switch in either of these circuits is closed, the lamps will glow. In Fig. 1-D, we have a series circuit including an ammeter which measures the current flowing in the circuit when the switch is closed.

The circuits shown in the various illustrations of Fig. 1, are completely wired, that is, current flows from the battery to the switch, thence to the lamps and back to the battery through wires. In Fig. 2, illustrations A and

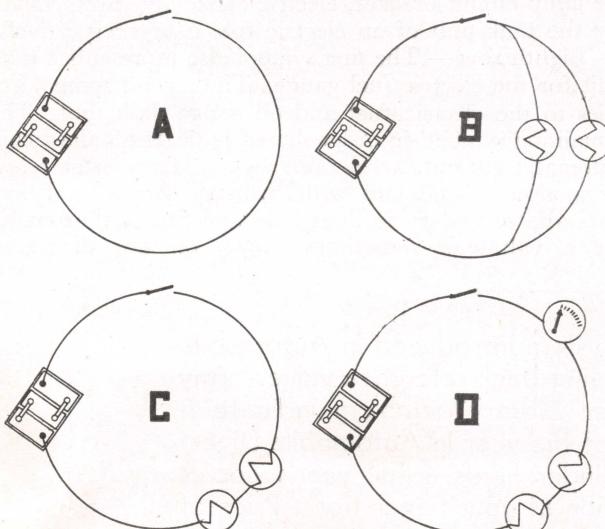


Fig. 1. Diagrams showing development of the electrical circuit in the form of circles. B, indicates units connected in parallel and C, in series

B show the equivalent circuits of Figs. 1-A and 1-B; however, a single wire is used and the circuit is completed through the ground as shown by the dotted lines, the lamps and battery being connected to a metal circuit.

In reading a wiring diagram these simple facts should be kept in mind and in tracing each circuit, the circle forms a convenient means of picturing in mind the path of the current for any circuit. The two-wire system as shown in Fig. 1 is rarely used in automotive practice, the single wire or ground return system as shown in Fig. 2, being employed. We have the same conditions in either two-wire or single wire systems; however, in the latter the wiring forms one side of the circuit

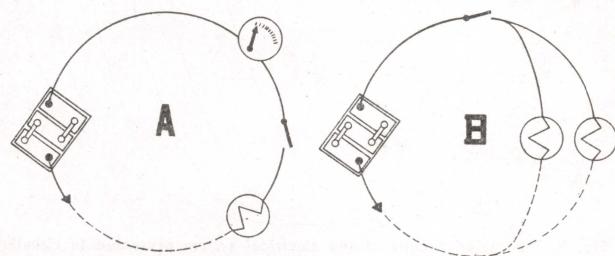


Fig. 2. Circular diagram for series and parallel single wire or ground return system

or half the circle and the metallic parts of the chassis form the other half of the circuit or circle. The important fact is that we must always be able to trace the current from a definite point through the circuit and back to the same point again. Current cannot flow unless there is a continuous path; a break in the circuit, no matter where located will stop the flow of current completely.

If we construct a chassis wiring diagram of the major electrical circuits such as the starting, lighting, horn and ignition units in the form of a circle as shown in Fig. 3, we discover that they are arranged in parallel, a fact which is not evident when viewing the usual wiring diagram. It will be noted that the units connected in parallel include the starting motor, horn, generator, low tension or primary circuit of the ignition system which comprises the ignition switch, coil and breaker mechanism and finally the circuit for the lights.

Tracing each circuit individually from the battery terminal, we find the starting switch is in series with the starting motor; the horn is in series with the horn button; the cut-out is in series with the generator; the coil and distributor are in series with the ignition switch and the lamps in series with the lighting switch. The completion of each circuit is through the ground to the ground strap of the battery and thence to the battery. The lamp circuit has a fuse in series with the switch which protects the light circuits for the head, side and tail lamps, but not the ignition circuit. The light circuits are shown controlled by a single switch as in current practice.

The details of electrical circuits of various cars will vary as there are many wiring schemes and combinations of units and switches which may be employed, but all systems follow closely the simple and fundamental diagram shown in Fig. 3, regardless of how complicated the wiring diagram for the car may appear.

Important to keep in mind is that a single wire being used, all major units are "grounded" and also arranged in parallel. A little consideration of any diagram no matter how complicated will indicate this simple analysis applies in every case. Owing to the separate functions of the starting, ignition, horn, and lighting circuits, these are always controlled by separate switches, al-

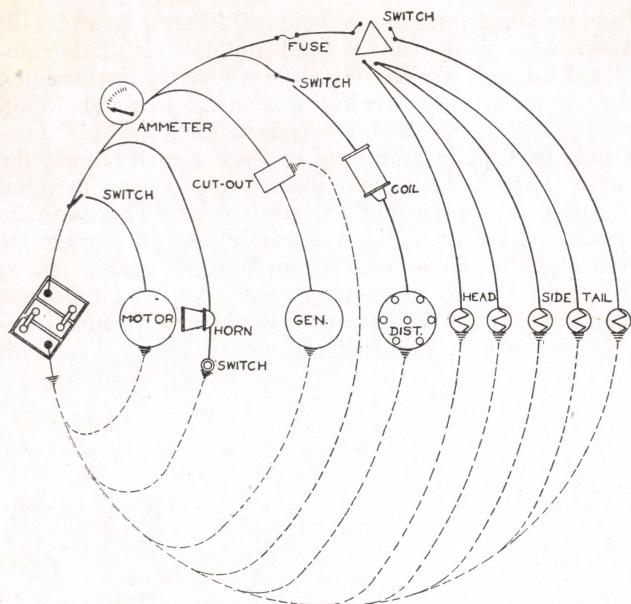


Fig. 3. The major circuits of the electrical system presented in circular form, indicating they are in parallel

though the ignition switch might be included in the lighting system switch unit. Stop lights, signal lights, interior body lights, instrument lights, etc., are generally controlled by separate switches. This is also true of control of head lamp beams, a separate foot switch being used to control the passing beams.

Modern diagrams have most of the important units designated on the diagram; however, there are many symbols employed to eliminate detail and make the diagram compact and knowing the meaning of these symbols makes reading the diagram simple. In Fig. 4, an attempt has been made to present a number of the more generally used symbols.

First row — Reading from left to right we have the familiar plus and minus signs which represent the positive and negative side of the circuit usually appearing on the battery terminals. Next is the symbol which denotes a ground or circuit completed through ground. Then is illustrated a tapped connection; a cross-over or point where two wires not connected cross each other on the diagram. The remaining illustrations show the heavy cable used in the starter circuit, an armored cable as used on the ignition lock wire, a single connector and then a triple connector.

Second row — The arrows show the direction of rotation for the ignition distributor, generator or starting motor. The next three illustrations show symbols which designate a fuse, while the fifth one indicates a spare fuse. The next illustration shows one method of indicating an instrument lamp, then one method of indicating any type of lamp. The second last illustration in the row is the symbol indicating a double filament bulb and the last one a junction block.

Third row — The first two illustrations show symbols employed for the battery; the next three for the ammeter; the next two for the starter switch; then a light switch and finally a foot or beam control switch.

Fourth row — The first three illustrations show symbols for a horn button, the balance a toggle switch, push button switch, dome light switch and the others a stop light switch.

Fifth row — The first symbol is one that is used for any type of switch but more generally intended to indicate a single throw knife switch. The remaining illustrations apply to the ignition system and are respectively condenser, primary winding, secondary winding, resistance, contacts (two illustrations), coil, distributor and a double dealing distributor for system employing two coils.

Sixth row — The first illustration indicates a vibrator type horn. The next six illustrations are generator symbols the fifth illustration in the row indicating a shunt wound machine and the sixth a series wound machine. The eighth illustration shows a circuit breaker and the ninth a grounded brush.

Seventh row — The first symbol indicates a current regulator and the second a voltage regulator. The next three illustrations are symbols for the starting motor

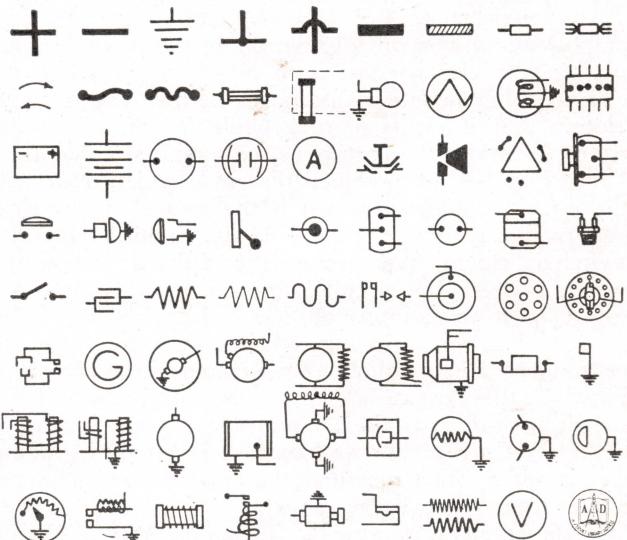


Fig. 4. Showing various symbols which have been used on wiring diagrams

and the remaining illustrations in this row are symbols for lamp circuit breaker, electric choke and two symbols for the tank unit of an electric fuel gauge respectively.

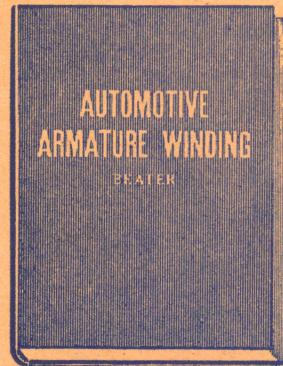
Eighth row — The first symbol also represents a tank unit for the electric fuel gauge. The second symbol applies to the electric fuel and oil gauge dash unit. The remaining symbols in order shown indicate a ballast coil, automatic cut-out, accelerator switch, thermostat relay, compound wound coil with primary shown in heavy lines and secondary in light lines and finally the symbol for a voltmeter sometimes shown on test diagrams.



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—The Editors.

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2 TUNE-UP WALL CHARTS—big, banner charts that divide and sub-divide the engine and its various units for troubles, causes and remedies. The sectional drawings will interest every car owner and make your sales talk doubly effective. Chart measures 48x36", is printed in red and black on brilliant, tough yellow stock.

1 TUNE-UP MANUAL telling how to SELL and DO tune-up work; where to begin and the procedure for the entire car. Complete tune-up data on all models from 1931 right up to date, is included.

The Tune-Up Kit places in your hands a formula for interesting your trade in periodic tune-up and selling needed service. Start it cashing in for you at once.

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